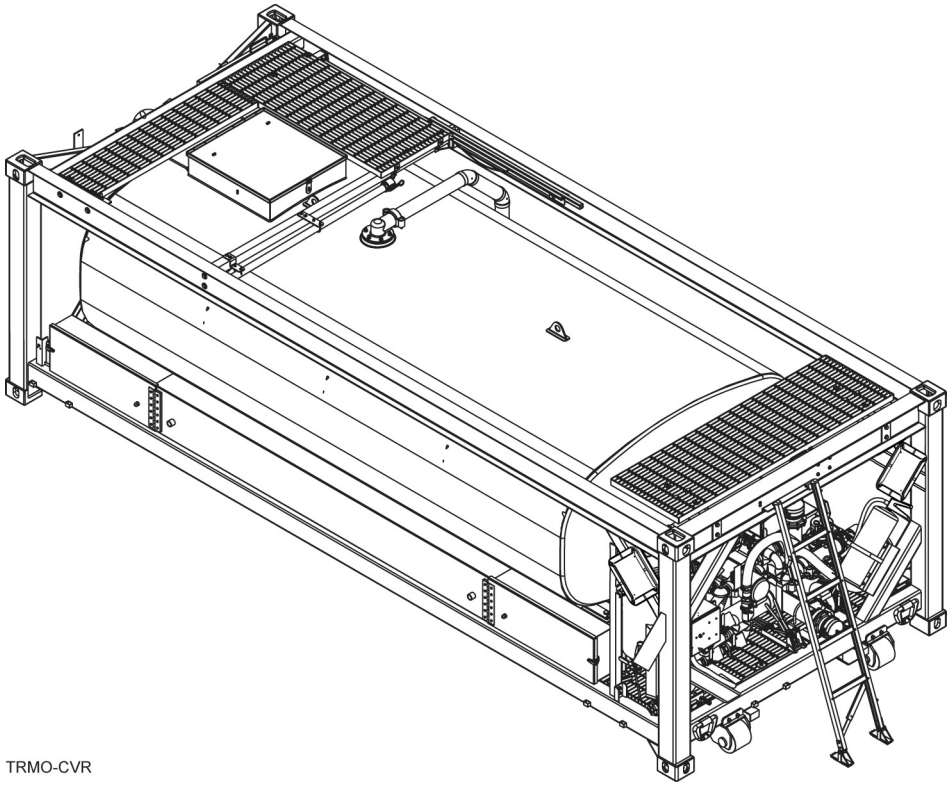
TM 10-4930-371-23&P

FIELD MAINTENANCE MANUAL INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST (RPSTL)

FOR

MODULAR FUEL SYSTEM TANK RACK MODULE (MFS TRM) M107A1 NSN 4930-01-612-3541 (EIC 2UM) PART NUMBER: 1051A



TRMO-CVR

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HEADQUARTERS, DEPARTMENT OF THE ARMY
25 SEPTEMBER 2017

WARNING SUMMARY

This warning summary contains general safety and hazardous materials warnings that must be understood and applied during operation and maintenance of this equipment. Failure to observe these precautions could result in injury or death to personnel. Also included are explanations of safety and hazardous materials icons used with this technical manual.

FIRST AID DATA

FOR INFORMATION ON FIRST AID, REFER TO TC 4-02.1.

EXPLANATION OF SAFETY WARNING ICONS

ELECTRICAL - electrical wire to arm with electricity symbol running through human body shows that shock hazard is present.

EYE PROTECT - arrows bouncing off of goggles shows that particles flying through the air will harm eyes.

FLYING PARTICLES - arrows bouncing off face with face shield shows that particles flying through the air will harm face.

HEAVY OBJECT - human figure stooping over heavy object shows physical injury potential from improper lifting technique.

HEAVY PARTS - heavy object on human figure shows that heavy parts present a danger to life or limb.

HOT AREA - hand over object radiating heat shows that part is hot and can burn.

PINCH POINT - object crushing human figure shows that areas between vehicles or parts present a danger to life or limb.

SLICK FLOOR - wavy line on floor with legs prone shows that slick floor presents a danger from falling.

WARNING SUMMARY - Continued

EXPLANATION OF SAFETY WARNING ICONS - Continued

EXPLOSION - this rapidly expanding symbol shows that the material may explode if subjected to high temperatures, sources of ignition or high pressure.

GENERAL SAFETY WARNINGS DESCRIPTION

WARNING

- Know the load limits of your lifting device before attempting to lift the MFS TRM. Keep personnel at least 6 ft (1.83 m) away from the MFS TRM when it is being raised. Failure to comply could result in injury or death to personnel.

WARNING

- When operating the MFS TRM in temperatures of 100ºF (38ºC) or higher, take extra care to minimize the possibility of an explosion and fire.
- Fuels evaporate very quickly. Fuel contact of skin can quickly lower the temperature of exposed skin making the area susceptible to frost bite. Prevent leakage of fuel onto bare skin of personnel.
- When operating the MFS TRM in temperatures down to -25ºF (-31ºC), take extra care to minimize the possibility of frostbite to personnel.
- Failure to comply could result in injury or death to personnel.

WARNING

- Rapid filling of the MFS TRM can cause a buildup of static electricity, leading to possible explosion. Fill MFS TRM units slowly to minimize static buildup. Ensure all grounding and bonding procedures are performed in accordance with (IAW) ATP 4-43. Failure to comply with this warning may result in injury or death to personnel.

WARNING SUMMARY - Continued

GENERAL SAFETY WARNINGS DESCRIPTION - Continued

WARNING

- Improper installation of o-rings and gaskets when repairing the MFS TRM units can cause fuel leaks, leading to possible explosion. Follow inspection and maintenance procedures carefully to ensure integrity of o-rings and gaskets. Failure to comply with this warning may result in injury or death to personnel.

WARNING

- Electrical shock can cause injury or death to personnel. When working near, replacing, or servicing any electrical component, disconnect power cable. Ensure power is disconnected from MFS TRM before performing this procedure. Failure to comply may result in injury or death to personnel.

WARNING

- Tank assembly weighs approximately 8,600 lbs. Ensure hoisting equipment has a suitable capacity for lifting tank assembly. Failure to comply can result in injury or death to personnel.

WARNING SUMMARY - Continued

GENERAL SAFETY WARNINGS DESCRIPTION - Continued

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Use a drip pan to collect leaking fuel. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure fuel laden rags or absorbent materials are disposed according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the Modular Fuel System Tank Rack Module (MFS TRM) prior to the transfer of fuel.
- Follow all fuel operations IAW ATP 4-43. Ensure grounding and bonding connections are made properly before any fueling operations. Stop fueling operations immediately at the first sign of a leak or malfunction.
- Wet metal surfaces are slippery. Use caution when climbing on top of MFS TRM.
- Ground self and equipment before any fueling operations to prevent explosion caused by electrostatic charge.
- Failure to comply may result in injury or death to personnel, damage to equipment, and/or damage to the environment.

WARNING

- The MFS TRM tank is a confined space. No operator or maintainer level maintenance personnel are authorized inside tank. Failure to follow this warning may result in injury or death to personnel.

EXPLANATION OF HAZARDOUS MATERIALS ICONS

BIOLOGICAL - the abstract symbol bug shows that a material may contain bacteria or viruses that present a danger to life or health.

WARNING SUMMARY - Continued

EXPLANATION OF HAZARDOUS MATERIALS ICONS - Continued

CHEMICAL - drops of liquid on hand shows that the material will cause burns or irritation to human skin or tissue.

CRYOGENIC - hand in block of ice shows that the material is extremely cold and can injure human skin or tissue.

EXPLOSION - rapidly expanding symbol shows that the material may explode if subjected to high temperatures, sources of ignition or high pressure.

POISON - skull and crossbones shows that a material is poisonous or is a danger to life.

RADIOACTIVE - three circular wedges shows that radioactive energy is emitted which can injure tissue and organs.

VAPOR - human figure in a cloud shows that material vapors present a danger to life or health.

HAZARDOUS MATERIALS DESCRIPTION

WARNING

CORROSION PREVENTATIVE COMPOUND

Corrosion preventive compound is toxic and an irritant to eyes, skin, and respiratory system. Goggles and gloves must be worn when working with corrosion preventive compound. Avoid contact with eyes and skin. Avoid breathing vapors and ensure there is adequate ventilation. If sealing compound contacts eyes, flush eyes with cold water for at least 15 minutes and seek immediate medical attention. If sealing compound contacts skin, wash skin thoroughly with soap and water. Failure to comply may result in injury or death to personnel.

WARNING SUMMARY - Continued

HAZARDOUS MATERIALS DESCRIPTION - Continued

WARNING

DIELECTRIC GREASE

Goggles and gloves must be worn when working with dielectric grease. Avoid contact with eyes and skin. If dielectric grease contacts eyes, flush eyes with cold water for at least 15 minutes and seek immediate medical attention. If dielectric grease contacts skin, wash skin thoroughly with soap and water. Failure to comply may result in injury to personnel.

WARNING

ELECTRIC SHOCK

Ensure all sources of power are disconnected from the MFS TRM before proceeding with maintenance. Failure to comply may result in injury or death to personnel or damage to equipment.

WARNING SUMMARY - Continued

HAZARDOUS MATERIALS DESCRIPTION - Continued

WARNING

FUEL

Goggles and gloves must be worn when working around fuel. Do not smoke, use open flame, make sparks, or create other ignition sources or static electricity around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher present and available. Failure to comply may result in injury or death to personnel.

Follow fuel operations IAW ATP 4-43. Ensure grounding connections are made properly before any fueling operations. Stop fueling operations immediately at the first sign of a leak or malfunction.

Leaking fuel can ignite and cause serious injury to personnel and damage to equipment.

Discharge static electricity before fueling operations by touching a metal surface away from fuel nozzle. Static electricity may cause fuel to ignite.

Cellular phones or other electronic devices must not be used within 25 ft (7.6 m) of MFS TRM. Use of cellular phones and other electronic devices during fueling may cause fuel to ignite.

Do not wear wool, nylon, silk, rayon, or other items having a tendency to generate static electricity. Static electricity may cause fuel to ignite.

Wear clean cotton clothing with no metal buttons, zippers or fasteners. Remove all contents from pockets. Static electricity from metal objects may cause fuel to ignite.

Use cotton rags for cleaning purposes; other material may generate static electricity and cause fuel to ignite.

Failure to comply may result in injury to personnel, damage to equipment and/or damage to the environment.

WARNING SUMMARY - Continued

HAZARDOUS MATERIALS DESCRIPTION - Continued

WARNING

SEALING COMPOUND

Primer and sealing compound are flammable, toxic, and an irritant to eyes, skin, and respiratory system. Do not use near open flame or excessive heat. Goggles and gloves must be worn when working with sealing compound. Avoid contact with eyes and skin. Avoid breathing vapors and ensure there is adequate ventilation. If sealing compound contacts eyes, flush eyes with cold water for at least 15 minutes and seek immediate medical attention. If sealing compound contacts skin, wash skin thoroughly with soap and water. Failure to comply may result in injury or death to personnel.

WARNING

SOLVENT CLEANING COMPOUND

Solvent cleaning compound MIL-PRF-680 Type III is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles, Use in well-ventilated areas. Keep away from open flames and other sources of ignition. Failure to comply may cause injury or death to personnel.

WARNING

GREASE

Grease contains ingredients that can cause mild skin contact hazard. Treat random or occasional skin contact with mild soap and water. Gloves and eye protection is required with heavy, constant exposure. Do not ingest. Immediately clean up any spilled compound. Comply with local procedures and environmental regulations when disposing of grease or cleanup materials. Failure to comply could result in injury to personnel and/or damage to the environment.

CHANGE NO. 1

DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 15 MARCH 2024

FIELD MAINTENANCE MANUAL INCLUDING REPAIR PARTS AND SPECIAL TOOS LIST (RPSTL) FOR MODULAR FUEL SYSTEM TANK RACK MODULE (MFS TRM) M107A1 NSN 4930-01-612-3541 (EIC 2UM) PART NUMBER: 1051A

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TM 10-4930-371-23&P, 25 September 2017, is updated as follows:

1. File this sheet in front of the manual for reference.
2. This change is a result of the addition of ADR components to existing MFS TRM systems and includes changes to general information work packages, troubleshooting procedures, preventive maintenance checks and services procedures, maintainer maintenance procedures, RPSTL figures, and supporting information work packages.
3. New or updated text is indicated by a vertical bar in the outer margin of the page. New and changed illustrations are also identified by vertical bar adjacent to the figure number and illustration.
4. Remove old pages and insert new pages as indicated below:

Remove Pages	Insert Pages
Front cover	Front cover
a through g/blank	a through h
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i through xxxiii/blank	i through xxxvi
Index-1 through Index-6	Index-1 through Index-7/blank

5. Replace the following work packages with their revised version.

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6. Add the following new work packages.

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WP 0144.4
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DEPARTMENT OF THE ARMY
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FOR

MODULAR FUEL SYSTEM TANK RACK MODULE
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M107A1
NSN 4930-01-612-3541 (EIC 2UM)
PART NUMBER: 1051A

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

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HOW TO USE THIS MANUAL

USING THIS MANUAL

This technical manual describes field level maintenance requirements for the MFS TRM.

When using this manual, read and understand the entire maintenance action before performing the task. Also, read and understand all warnings, cautions, and notes; as well as general safety precautions, that apply to the task to be performed. The warning summary will inform personnel of hazards associated with the equipment to be worked on. However, the summary is not all inclusive and personnel should be aware at all times of hazardous conditions that may arise.

TRM WITH ADR

Systems upgraded with "European Agreement Concerning the International Carriage of Dangerous Goods by Road" (ADR) changes will have specific callouts and art in Work Packages (WP) that will apply to TRM with ADR systems only.

ACCESSING INFORMATION

Information is accessed by referring to the table of contents, located in the front of this manual. Or, by looking in the alphabetical index, located in the back of this manual.

To locate information using the table of contents, first scan the chapter titles to determine the general area in which your information will be contained. After locating the proper chapter, look beneath the chapter title to find the desired informational or procedural work package title. To the right of the work package title is a work package sequence number. This work package sequence will direct you to the proper work package. Work packages are arranged in numerical order in this manual.

ILLUSTRATIONS

Various visual methods are used to locate and repair components. Locator illustrations, exploded views, and cutaway diagrams make the information in the manual easier to understand and follow.

GENERAL INFORMATION

This work package gives a brief description of the major components and provides illustrations showing the location of the components. Knowing the major components of the system is the first step to understanding system operation and maintenance.

THEORY OF OPERATION

This work package contains the theory of operation for the system. Theory of operation is provided to familiarize the user system operating principles. Once the system operating principles are understood, the user is better equipped to operate, troubleshoot, and maintain the system.

TROUBLESHOOTING PROCEDURES

A troubleshooting index work package is contained in this manual to permit easy location of troubleshooting procedures. Full directions for using the troubleshooting index and the accompanying troubleshooting procedures are contained in the troubleshooting index work packages. The troubleshooting procedure work package(s) immediately follow the troubleshooting index.

HOW TO USE THIS MANUAL - Continued

PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) TABLE AND MAINTENANCE INSTRUCTIONS

Preventive Maintenance Checks and Services (PMCS) are performed to keep the MFS TRM in operating condition. The checks are used to find, correct, or report problems. Maintainers should perform the PMCS as shown in the PMCS table in WP 0048. Using the PMCS table, preventive maintenance checks and services are performed every day the equipment is operated. To locate a maintenance procedure, open the manual to the Table of Contents located in the front of this manual. Locate Chapter 3, Maintainer Maintenance Instructions. Look down the list and find the maintenance procedure to be accomplished. On the right side of the maintenance procedure will be a work package number. Turn to the work package indicated. Before beginning the maintenance task, look through the procedure to familiarize yourself with the entire maintenance procedure.

MAINTENANCE INSTRUCTIONS

To locate a maintenance procedure, open the manual to the Table of Contents, located in the front of this manual. Look down the list and find the maintenance procedure to be accomplished.

On the right side of the maintenance procedure will be a work package number. Turn to the work package indicated. Before beginning the maintenance task, look through the procedure to familiarize yourself with the entire maintenance procedure. At the top of the task you will have a section called INITIAL SETUP. There are five basic headings listed under INITIAL SETUP.

a. **Tools and Special Tools.** Lists all tools (standard or special) required to perform the task. Tools are identified with an item number and table number from the applicable work package, located in Chapter 5, Supporting Information.

b. **Materials/Parts.** Lists all mandatory replacement parts, expendable and durables necessary to perform the task. Expendable and durables and mandatory replacement parts are identified with an item number from the applicable work package located in Chapter 5, Supporting Information.

c. **Personnel Required.** Lists all personnel necessary to perform the task.

d. **References.** Include any other manuals necessary to complete the task. When there are no references listed, all steps necessary to complete the task are contained within this manual. A listing of reference materials is contained in the work package entitled References in Chapter 5, Supporting Information.

e. **Equipment Condition.** Notes the conditions that must exist before starting the task. The equipment condition will also include any prerequisite maintenance tasks to be performed with reference to the work package number or the TM number.

REPAIR PARTS AND SPECIAL TOOLS LIST

Refer to Chapters 4 and 5 when requisitioning parts, special tools, and equipment. Identify the mandatory repair parts required to perform the task listed at the top of the work package in the INITIAL SETUP. Using the reference provided, refer to the Repair Parts and Special Tools (RPSTL) work package in Chapter 4, Repair Parts and Special Tools List. Using that part number, refer to the Part Number Index work package in this manual. Look up the part number in the part number column and identify the figure and item number where the part is located. Turn to the figure and locate the item number listed. Verify that the item is correct.

INDEX

The Index, located in the back of this manual, contains an alphabetical list of all sections of this manual. For example, Location and Description of Major Components is found in Chapter 1. The work package sequence

HOW TO USE THIS MANUAL - Continued

number is found on the right side of the title where the Location and Description of Major Components is located. Turn to the work package indicated to find the description and location of each component.

CHAPTER 1

GENERAL INFORMATION, EQUIPMENT DESCRIPTION, AND THEORY OF OPERATION

MAINTAINER
GENERAL INFORMATION

SCOPE

This work package contains general information about the MFS TRM.

1. Type of Manual: Field maintenance manual with repair parts and special tools list.

2. Equipment Name: Modular Fuel System Tank Rack Module (MFS TRM).

3. Purpose of Equipment: The MFS TRM is designed to be used by forward area petroleum personnel to receive, store, and dispense fuel.

4. Personnel: Procedures in this manual are intended to be performed by Military Occupation Skill (MOS) 91J Quartermaster and Chemical Equipment Repairer.

MAINTENANCE FORMS, RECORDS AND REPORTS

Department of the Army forms and procedures used for equipment maintenance will be those prescribed by (as applicable) DA PAM 750-8, The Army Maintenance Management System (TAMMS); DA PAM 738-751, Functional Users Manual for the Army Maintenance Management System-Aviation (TAMMS-A); or AR 700-138, Army Logistics Readiness and Sustainability.

REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR)

If your MFS TRM needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you do not like about your equipment. Let us know why you do not like the design or performance.

All non-Aviation/Missile EIRs must be submitted through the Product Data Reporting and Evaluation Program (PDREP) Web site. The PDREP site is: https://www.pdrep.csd.disa.mil/.

If you do not have Internet access, you may submit your information using an SF 368 (Product Quality Deficiency Report). You can send your SF 368 using email, regular mail, or fax using the addresses/fax numbers specified in DA PAM 750-8, The Army Maintenance Management System (TAMMS) Users Manual. We will send you a reply.

CORROSION PREVENTION AND CONTROL (CPC)

Corrosion prevention and control of Army materiel is a continuing concern. It is important that any corrosion problems with this item be reported so that the problem can be corrected and improvements can be made to prevent the problem in future items. The term “corrosion” means the deterioration of a material or its properties due to a reaction of that material with its chemical environment. An example is the rusting of iron. Corrosion damage in metals can be seen, depending on the metal, as tarnishing, pitting, fogging, surface residue, and/or cracking. Plastics, composites, and rubbers can also degrade (also considered to be corrosion based on the above definition of corrosion). Degradation is caused by thermal (heat), oxidation (oxygen), solvation (solvents), or photolytic (light, typically ultraviolet) processes. The most common exposures are excessive heat or light. Damage from these processes will appear as cracking, softening, swelling, and/or breaking. The US Army has defined the following nine (9) forms of corrosion used to evaluate the deterioration of metals. These shall be used when evaluating and documenting corrosion.

UNIFORM (or general attack): Affects a large area of exposed metal surface, like rust on steel or tarnish on silver. It gradually reduces the thickness of the metal until it fails.

CREVICE: Occurs in crevices created by rubber seals, gaskets, bolt heads, lap joints, dirt or other surface deposits. It will develop anywhere moisture or other corrosive agents are trapped and unable to drain or evaporate.

CORROSION PREVENTION AND CONTROL (CPC) - Continued

SELECTIVE LEACHING: One element, usually the anodic element of an alloy, corrodes away, leaving the cathodic element. This can create holes in metal.

INTERGRANULAR: Metal deterioration caused by corrosion on the bonds between or across the grain boundaries of the metal. The metal will appear to be peeling off in sheets, flaking, or being pushed apart by layers. A particular type of intergranular corrosion is exfoliation.

PITTING: This can result from conditions similar to those for crevice corrosion. Pits can develop on various materials due to their composition. Rifle boxes are big victims of pitting.

EROSION: Results when a moving fluid (liquid or gas) flows across a metal surface, particularly when solid particles are present in the fluid. Corrosion actually occurs on the surface of the metal, but the moving fluid washes away the corrosion and exposes a new metal surface, which also corrodes.

FRETTING: Occurs as a result of small, repetitive movements (e.g., vibration) between two surfaces in contact with each other. It's usually identified by a black powder corrosion product or pits on the surface.

GALVANIC: Occurs when two different types of metal come in contact with each other, like steel bolts on aluminum, for example. This is a common problem on aircraft because of their mix of metals.

STRESS: Term used to describe corrosion cracking and corrosion fatigue.

Where an item is not ready/available due to one of these forms of corrosion, it shall be recorded as a corrosion failure in the inspection record and the appropriate code (170) for corrosion shall be used when requesting/ performing maintenance.

SF Form 368, Product Quality Deficiency Report should be submitted to the address specified in DA PAM 750-8, The Army Maintenance Management System (TAMMS) Users Manual.

DESTRUCTION OF ARMY MATERIAL TO PREVENT ENEMY USE

For procedures to destroy this equipment to prevent its use by the enemy, refer to TM 750-244-6, Procedures for Destruction of Materiel to Prevent Enemy Use.

PREPARATION FOR STORAGE OR SHIPMENT

Refer to TM 10-4930-371-10 for detailed procedures on preparing the MFS TRM for storage or shipment.

LIST OF ABBREVIATIONS/ACRONYMS

Abbreviation	Explanation
ADR	European Agreement Concerning the International Carriage of Dangerous Goods by Road
AR	Army Regulation
ATP	Army Technical Publications
BCT	Brigade Combat Team
BII	Basic Issue Items
BT	Bottle

LIST OF ABBREVIATIONS/ACRONYMS - Continued

Abbreviation	Explanation
BX	Box
C	Celsius
CAGEC	Commercial and Government Entity Code
COEI	Components of End Item
cm	Centimeters
CN	Can
CPC	Corrosion Prevention and Control
CTA	Common Table of Allowances
DA	Department of the Army
DA PAM	Department of the Army Pamphlet
EA	Each
EDIL	Expendable and Durable Items List
e.g.	example given
EIR	Equipment Improvement Recommendations
F	Fahrenheit
FGC	Functional Group Code
FM	Field Manual
ft.	Foot
ft-lbs.	Foot-Pounds
GAA	General Automotive and Artillery
gal.	Gallon
GMTK	General Mechanic’s Tool Kit
GPM	Gallon Per Minute
HEMTT	Heavy Expanded Mobility Tactical Truck

LIST OF ABBREVIATIONS/ACRONYMS - Continued

Abbreviation	Explanation
HEMTT-LHS	Heavy Expanded Mobility Tactical Truck-Load Handling System
IAW	In Accordance With
in.	Inch
ISO	International Organization for Standardization
IUID	Item Unique Identification
kg.	Kilogram
L	Liter
lbs.	Pounds
lbs-ft.	Pounds-Foot
lbs-in.	Pounds-Inch
LHS	Load Handling System
m	Meter
MAC	Maintenance Allocation Chart
MFS	Modular Fuel System
MOS	Military Occupational Skill
MTOE	Modified Table of Organization and Equipment
N	Newtons
Nm	Newton Meter
NATO	North Atlantic Treaty Organization
NBC	Nuclear, Biological, Chemical
NIIN	National Item Identification Number
NSN	National Stock Number
PAM	Pamphlet
PDREP	Product Data Reporting and Evaluation Program

LIST OF ABBREVIATIONS/ACRONYMS - Continued

Abbreviation	Explanation
PLS	Palletized Load System
PLST	Palletized Load System Trailer
PMCS	Preventive Maintenance Checks and Services
PQDR	Product Quality Deficiency Report
PR	Pair
QT	Quart
QTY	Quantity
ROM	Refuel-on-the-Move
RPSTL	Repair Parts and Special Tools List
RQR	Required
SATS	Standard Automotive Tool Set
SF	Standard Forms
SMR	Source, Maintenance, and Recoverability
SOP	Standard Operating Procedure
SRA	Specialized Repair Activity
TACOM	Tank and Automotive Command
TAMMS	The Army Maintenance Management System
TB	Tube
TIL	Tool Identification List
TM	Technical Manual
TMDE	Test, Measurement, and Diagnostic Equipment
TRM	Tank Rack Module
U/I	Unit of Issue
UOC	Usable On Code
VDC	Volts Direct Current

LIST OF ABBREVIATIONS/ACRONYMS - Continued

Abbreviation	Explanation
WP	Work Package

QUALITY OF MATERIAL

Material used for replacement, repair, or modification must meet the requirements of this TM. If quality of material requirements are not stated in this TM, the material must meet the requirements of the drawings, standards, specifications, or approved engineering change proposals applicable to the subject equipment.

SAFETY, CARE, AND HANDLING

The MFS TRM may be used to store various fuels. It must be assumed that residual fuel and fuel vapors are present in MFS TRM at all times, even after draining or purging. Therefore, equipment must always be handled with the same degree of caution as if it contained fuel. One or more fully charged fire extinguishers must be present at all times. A static electric charge is always present in all fuels. Any physical movement of fuel will increase static charge, for example when fuel is being pumped, stirred, shaken or splashed. If charge is allowed to build sufficiently, it will discharge, causing a spark that may ignite fuel vapors. Buildup of a static electric charge is controlled by bonding and grounding of MFS TRM. A ground rod and grounding cable are provided with MFS TRM and must be inspected, maintained, and used consistently and conscientiously to prevent fuel ignition due to electrostatic discharge. The system should always be grounded except when being transported. Fuels may contain toxic additives. Personal protective equipment should always be worn when working with MFS TRM. Fuels are dangerous under all conditions. Always observe fuel handling safety precautions and follow fuel handling procedures IAW ATP 4-43.

ITEM UNIQUE IDENTIFICATION (IUID)

There is an Item Unique Identification (IUID) marking located on the right rear data plate of the TRM. The marking must be scanned during performance of procedures to remove and replace the items marked or when turning in items or receiving them from supply or another unit. For information on location of the data plate with the IUID marking, refer to the TM 10-4930-371-10.

SUPPORTING INFORMATION FOR REPAIR PARTS, SPECIAL TOOLS, TEST, MEASUREMENT, AND DIAGNOSTIC EQUIPMENT (TMDE), AND SUPPORT EQUIPMENT

For authorized common tools and equipment, refer to Modified Table of Organization and Equipment (MTOE), CTA 50-970, Expendable/Durable Items (Except: Medical, Class V, Repair Parts, and Heraldic Items), CTA 50-909, Field and Garrison Furnishings and Equipment, CTA 8-100, Army Medical Department Expendable/ Durable Items, as applicable to your unit.

END OF WORK PACKAGE

MAINTAINER
EQUIPMENT DESCRIPTION AND DATA

EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES

The MFS TRM is used to receive, store, and issue fuel. The initial use of the MFS TRM is to provide mobile fuel storage and issuing capability for the Brigade Combat Team (BCT). The MFS TRM fielded to the BCT can be transported using a variety of configurations of Palletized Load System (PLS) trailers and trucks. Figure 1 illustrates some possible configurations. The MFS TRM can be used to support relocation of forces by providing refuel-on-the-move (ROM) capability. The units requiring the MFS TRM must possess the ability to rapidly change operational locations and provide fuel with minimum use of support assets. Each MFS TRM can transport approximately 2,500 gal. (9,464 L) of fuel over all types of terrain. The flexibility of the system allows the fuel capacity to be tailored to the tactical mission requirement.

The PLS and the Heavy Expanded Mobility Tactical Truck (HEMTT) with the Load Handling System (LHS) are each capable of loading the MFS TRM onto themselves or onto a trailer. This self-load/-unload capability eliminates many of the logistical and planning problems associated with current fuel doctrine, such as having to wait while collapsible tanks or bulk tankers are filled.

The MFS TRM provides the ability to rapidly establish fuel storage capability at any location without the use of material handling or construction equipment. A HEMTT-LHS or PLS can recover the MFS TRM, transport it to a new location, and position the system upon arrival. An empty, full, or partially loaded MFS TRM can be readied for transport, uploaded, and moved in a fraction of the time required for a collapsible tank. Operations can continue uninterrupted by replacing empty MFS TRMs with full ones.

The MFS TRM can also be used for line haul of bulk fuel throughout the theater. A PLS or HEMTT-LHS can transport two MFS TRMs – one on the truck and one on the PLS trailer – for a total of up to 5,000 gal. (18,928 L) of fuel. The increased mobility and capability of the HEMTT-LHS and PLS allow direct delivery of fuel to a brigade area. The truck unloads the full MFS TRM in the required position and loads any empty MFS TRM for transport back to the fuel resupply point. Although it cannot lift the MFS TRM onto or off a PLS trailer, a HEMTT Fueler (2,500 gal. [9,464 L]) can tow a PLS trailer with the MFS TRM to transport a total of 5,000 gal. (18,928 L).

The use of the HEMTT-LHS as the prime transporter results in increased cross-country mobility. This expanded capability is critical to uninterrupted resupply of fuel to maneuvering forces.

Some MFS TRM systems are equipped with additional components to allow the MFS TRM to comply with the European Agreement Concerning the International Carriage of Dangerous Goods by Road (ADR). The added components will include check valves, ball valves, grounding hardware, fire screen, and nameplates. There will also be changes incorporated including the fuel nozzle change and valve V14 location change. To verify if your system is a TRM without ADR or TRM with ADR, check the number of valves listed on the schematic data plate. If your system has V1 through V17 valves, it is a TRM without ADR. If your system has V1 through V23, it is a TRM with ADR. Please refer to the appropriate system with this manual while preforming repairs.

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS

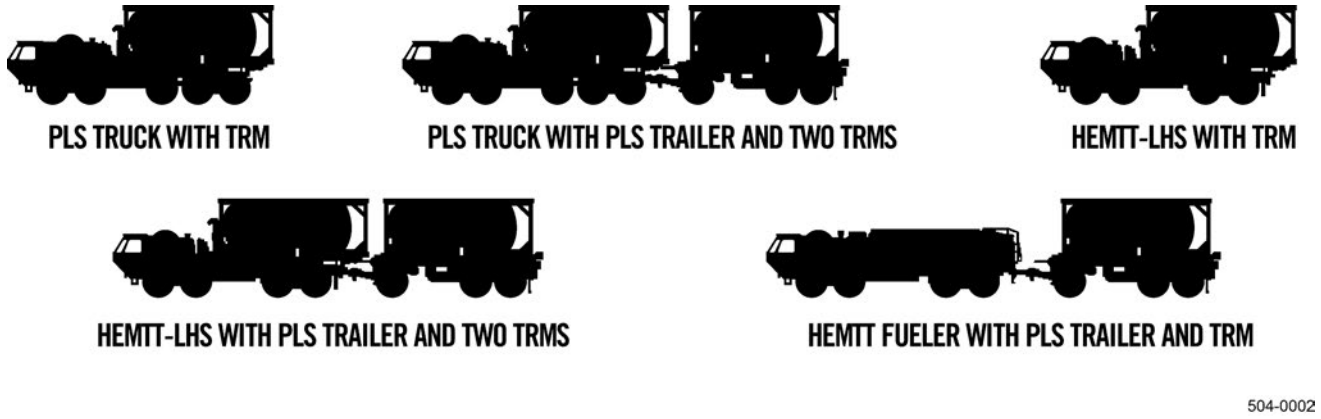

PLS TRUCK WITH TRM
PLS TRUCK WITH PLS TRAILER AND TWO TRMS
HEMTT-LHS WITH TRM
HEMTT-LHS WITH PLS TRAILER AND TWO TRMS
HEMTT FUELER WITH PLS TRAILER AND TRM
504-0002

Figure 1. MFS TRM Transport Configurations.

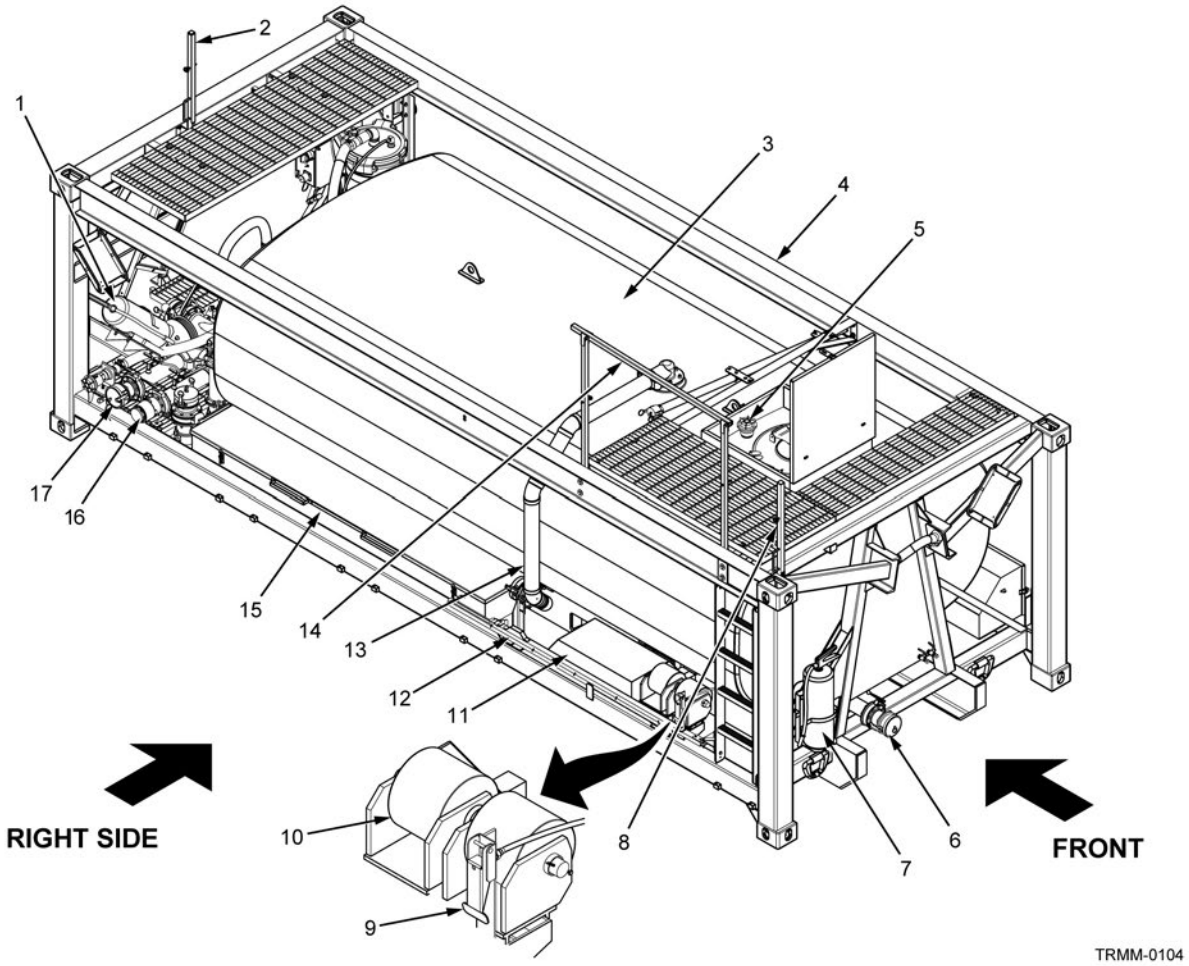


Figure 2. Tank Rack Module Major Components - Right Side and Front.

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS - Continued

Table 1. MFS TRM Major Components - Right Side and Front.

No.	Item	Description
1	Fire Extinguisher	Portable fire extinguisher used to suppress fires, mounted at the rear of the MFS TRM.
2	Rear Handhold	Handhold mounted at rear of MFS TRM for personnel use.
3	Tank Assembly	Tank assembly has a capacity of 2,500 gallons (9,464 L). It is equipped with a lockable manhole, internal baffles, a bottom loading valve and a pump loading valve.
4	Frame Assembly	Welded steel frame assembly encloses and supports the tank. Frame has integrated fittings and provisions for top and bottom lifting.
5	Top Loading Port F (V17)	Port F is mounted on top of the tank and consists of a 2-inch valve dry break coupling. It is used to top fill the tank assembly.
6	Port G	Port G is a 4-inch female camlock port located at the front of the MFS TRM that can be used for loading or discharge operations. The port is controlled by a butterfly valve.
7	Fire Extinguisher	Portable fire extinguisher used to suppress fires, mounted at the rear of the MFS TRM.
8	Front Handhold	Handhold mounted at front of MFS TRM for personnel use.
9	Emergency Shut Off Lever	Two emergency shut off levers are located on the sides of the MFS TRM. There is one on each side toward the front of the MFS TRM. Both shut off levers are red.
10	Roller Assemblies (Stowed)	Roller assemblies are stowed on the side of the MFS TRM and can be attached to the rear of the frame assembly to facilitate ground transportation of the MFS TRM.
11	Drip Pans	Drip pans are provided to catch residual fuel that may leak out when hoses are disconnected or during maintenance activities.
12	Stowable Ladder	Stowable ladder can be used to access the top of the MFS TRM and the components of the MFS TRM when mounted on the trailer. Ladder is also used to access rear catwalk when MFS TRM is on the ground.
13	Vapor Recovery Line	The vapor recovery line provides a vent for fumes and air to exit the tank assembly during loading operations. A 3-inch camlock fitting allows a hose to be attached.
14	Handrail	Collapsible handrail on front of MFS TRM for personnel use when on top of unit.
15	BII/COEI Cabinet	The BII/COEI cabinet provides storage for the Basic Issue Items supplied with the MFS TRM.

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS - Continued

Table 1. MFS TRM Major Components - Right Side and Front - Continued.

No.	Item	Description
16	Port A	Port A is a 4-inch D-1 port located on the right side of the MFS TRM that can be used for loading or discharge operations. The port is controlled by a butterfly valve.
17	Port B	Port B is a 4-inch female camlock port located on the right side of the MFS TRM that can be used for loading or discharge operations. The port is controlled by a butterfly valve.

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS - Continued

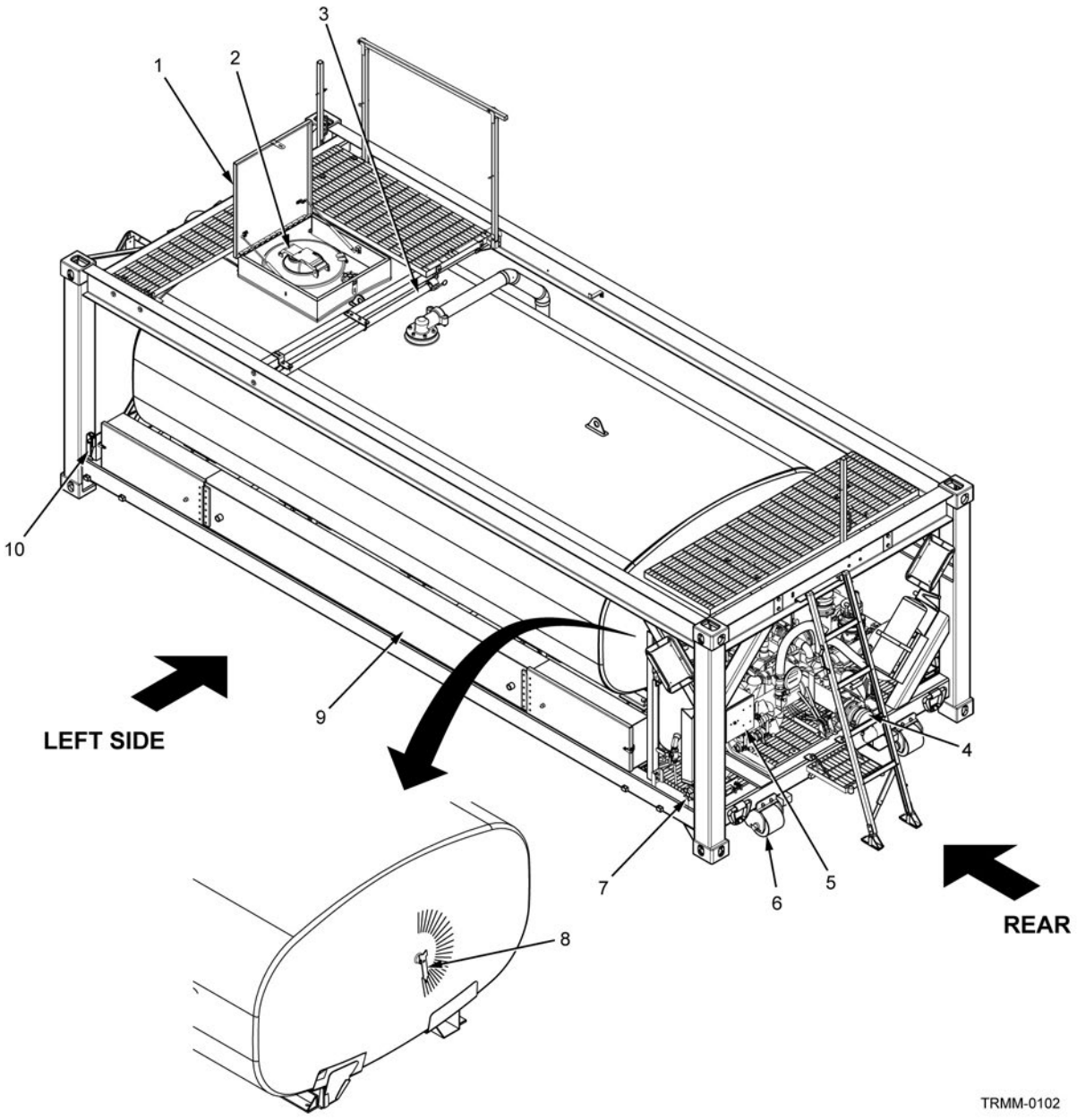


Figure 3. Tank Rack Module Major Components - Left Side and Rear.

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS - Continued

Table 2. MFS TRM Major Components - Left Side and Rear.

No.	Item	Description
1	Spillbox Cover	The spillbox lid is a hinged metal lid that allows the manhole to be locked.
2	Manhole Cover	The manhole cover is a spill-proof cover for the tank. It has an integrated relief valve to prevent pressure or vacuum build up inside the tank.
3	Gauge Stick Storage Tube	The Gauge Stick Storage Tube provides storage for the gauge stick. It is mounted on the top of the MFS TRM.
4	Port C	Port C is a 4-inch male camlock port located at the rear of the MFS TRM that can be used for MFS operations. The port is controlled by a butterfly valve.
5	Power Control Box	The Power Control Box houses the electrical controls for the MFS TRM. A toggle switch allows the operator to select between remote and local control. The Master Switch controls power to the pump assembly. A 70 amp circuit breaker protects against excessive current. Connectors are provided for a NATO slave device and the remote control switch.
6	Roller Assemblies (Emplaced)	Two removable roller assemblies are stowed on the side of the MFS TRM and can be attached to the rear of the frame assembly to facilitate ground transportation of the MFS TRM.
7	Port D	Port D is a 2-inch valved dry break port located on the left side of the MFS TRM that can be used for loading and discharge operations.
8	Tank Gauge	The Tank Gauge is mounted on the rear of the tank assembly and indicates +/- 10% of the fuel level in the tank assembly.
9	Hose Tube Cabinet Assembly	The Hose Tube Cabinet Assembly provides storage space for the 4-inch hoses and one 2-inch hose included with the MFS TRM.
10	Emergency Shut Off Lever	Two emergency shut off levers are located on the sides of the MFS TRM. There is one on each side toward the front of the MFS TRM. Both shut off levers are red.

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS - Continued

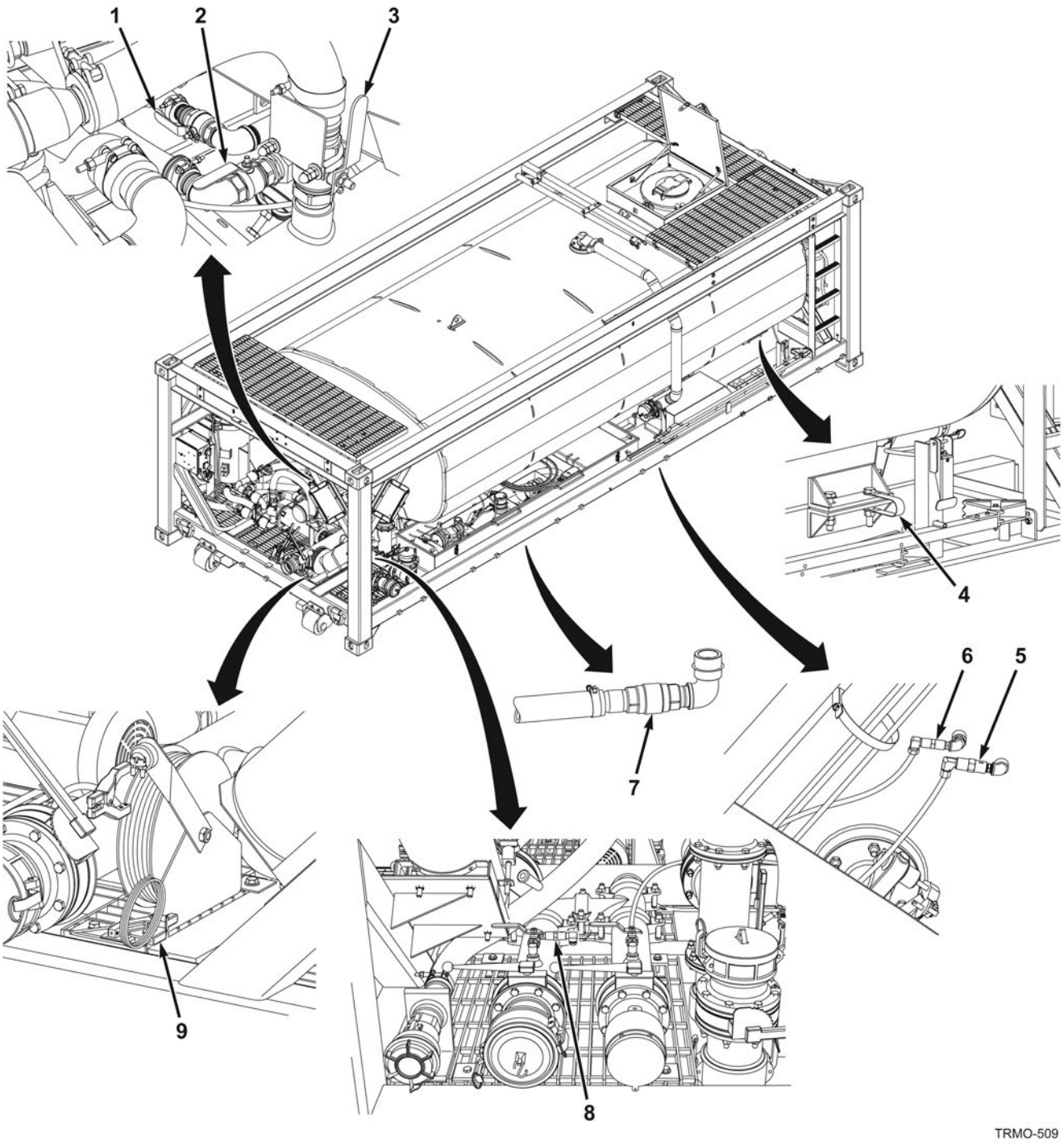


Figure 4. TRM With ADR Major Components.

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS - Continued

Table 3. TRM With ADR Major Components.

No.	Item	Description
1	Secondary Manual Shut Off Valve (V21)	Controls discharge to flow meter.
2	Secondary Manual Shut Off Valve (V22)	Shuts off fuel flow to pump.
3	Meter Outlet Valve (V14)	Same function as TRM without ADR.
4	Ground Strap	To ensure tank is grounded to frame.
5	Jet Sensor Check Valve (V19)	Automatically regulates vacuum from jet sensor.
6	Air Elimination Check Valve (V18)	Automatically regulates air elimination.
7	Hose Evacuation Check Valve (V20)	Automatically regulates evacuation from tank.
8	Vacuum Breaker Check Valve (V23)	Automatically regulates vacuum once VB1 is opened.
9	Bonding Clamp	To provide a ground to transport unit while shipping.

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS - Continued

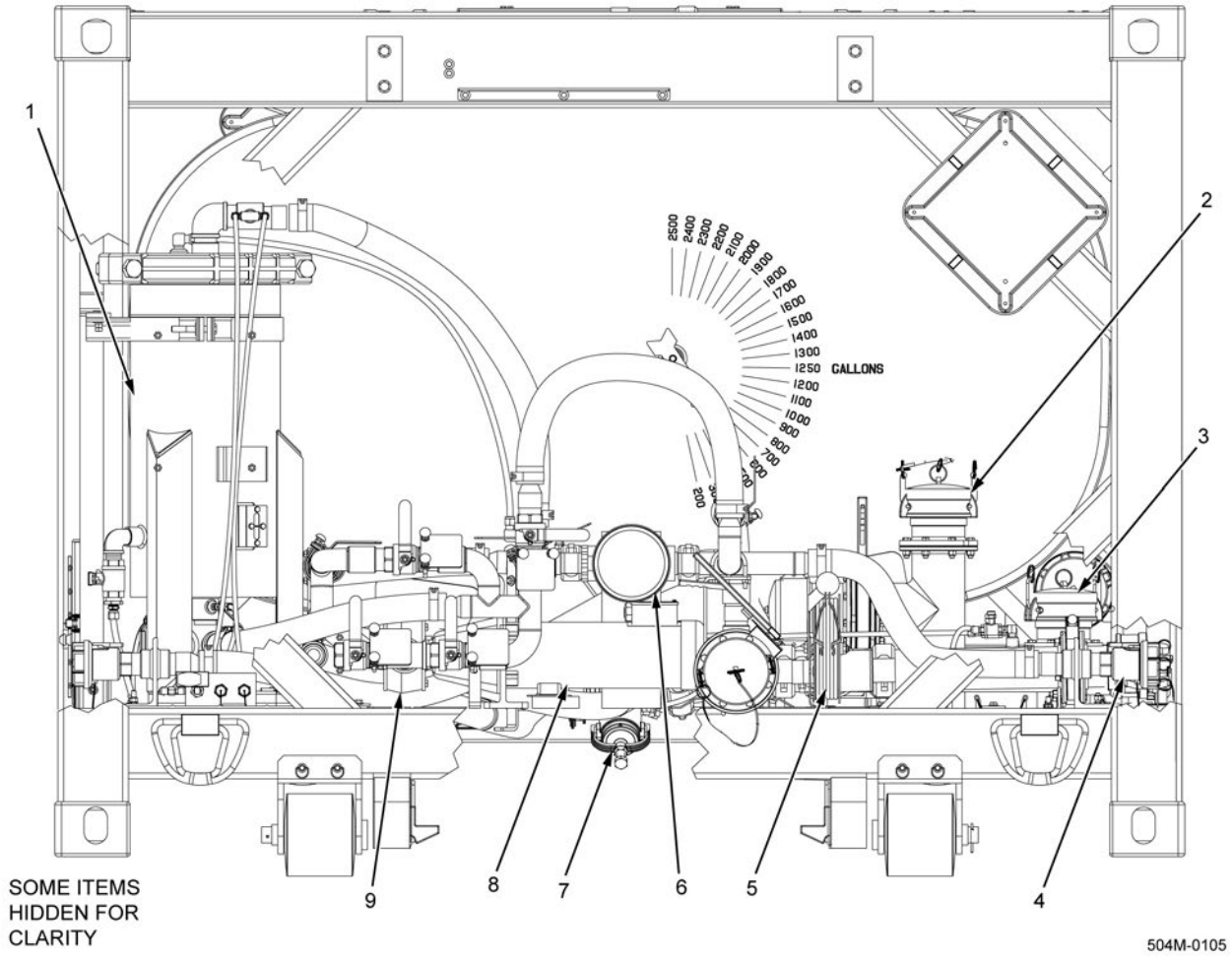


Figure 5. Tank Rack Module Major Components Pumping Components and Accessories.

Table 4. MFS TRM Major Components - Pumping Components and Accessories.

No.	Item	Description
1	Filter/Separator Assembly	The Filter/Separator Assembly is an aluminum vessel with a removable top that houses two filter elements that remove water and solid contaminants from fuel. The Filter/Separator Assembly has a sight gauge mounted on the side to allow the operator to monitor the water level inside the vessel. Sampling ports are also provided.
2	Tee Assembly	The Tee Assembly is a valved 4-inch tee with a built-in butterfly valve used during MFS TRM operations.
3	Valve Adapter Assembly	The Valve Adapter Assembly is a 4-inch adapter with a butterfly valve used for controlling fuel flow to and from external fuel supplies.

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS - Continued

Table 4. MFS TRM Major Components - Pumping Components and Accessories - Continued.

No.	Item	Description
4	Port E	Port E is a 2-inch valved dry break port located on the right side of the MFS TRM that can be used for loading and discharge operations.
5	Static Reel	The Static Reel houses a retractable 20-foot ground cable used to ground the MFS TRM.
6	Flow Meter Assembly	The Flow Meter Assembly is an analog meter that measures the fuel delivered during pumping operations. It can also be used in gravity discharge operations. The Flow Meter Assembly can be manually reset using a knob on the left side.
7	Strainer Assembly	The Strainer Assembly is mounted on the bottom of the tank assembly and has a removable screen that filters particulate matter from the fuel before it enters the pump assembly.
8	Electric Motor	The Electric Motor is a 24VDC powered electric motor that drives the Pump Assembly.
9	Pump	The Pump Assembly is a 35 GPM pump used to deliver fuel from the tank assembly to any of the ports. It is also used for hose evacuation procedures. Remote or local control of the pump is selected with a toggle switch on the Pump Control Box. Power to the pump is controlled by the Master Switch on the Power Control Box.

EQUIPMENT DATA

Table 5. MFS TRM Equipment Data.

Item	Value/Description
Capacity	JP8/F24: 2,500 gal. (9,464 L) Diesel: 2,400 gal. (9,085 L)
TRM without ADR Weight (Empty)	8,600 lbs. (3,901 kg)
TRM without ADR Weight (With 2,500 gal. of JP8/F24 fuel)	25,850 lbs. (11,725 kg)
TRM with ADR Weight (Empty)	8,660 lbs. (3,928 kg)
TRM with ADR Weight (With 2,500 gal. of JP8/F24 fuel)	25,910 lbs. (11,753 kg)
Height	72.19 in. (1.83 m)
Length	238.5 in. (6.06 m)
Width	96 in. (2.44 m)
Flow Rate	35 GPM nominal (132.5 L/m) Filter/Separator Assembly: 35 GPM nominal (132.5 L/m)

Table 6. MFS TRM Lifting Data.

Item	Value/Description
TRM without ADR Maximum Gross Weight	25,850 lbs. (11,725 kg)
TRM without ADR Tare Weight	8,600 lbs. (3,901 kg)
TRM with ADR Maximum Gross Weight	25,910 lbs. (11,753 kg)
TRM with ADR Tare Weight	8,660 lbs. (3,928 kg)

EQUIPMENT DATA - Continued

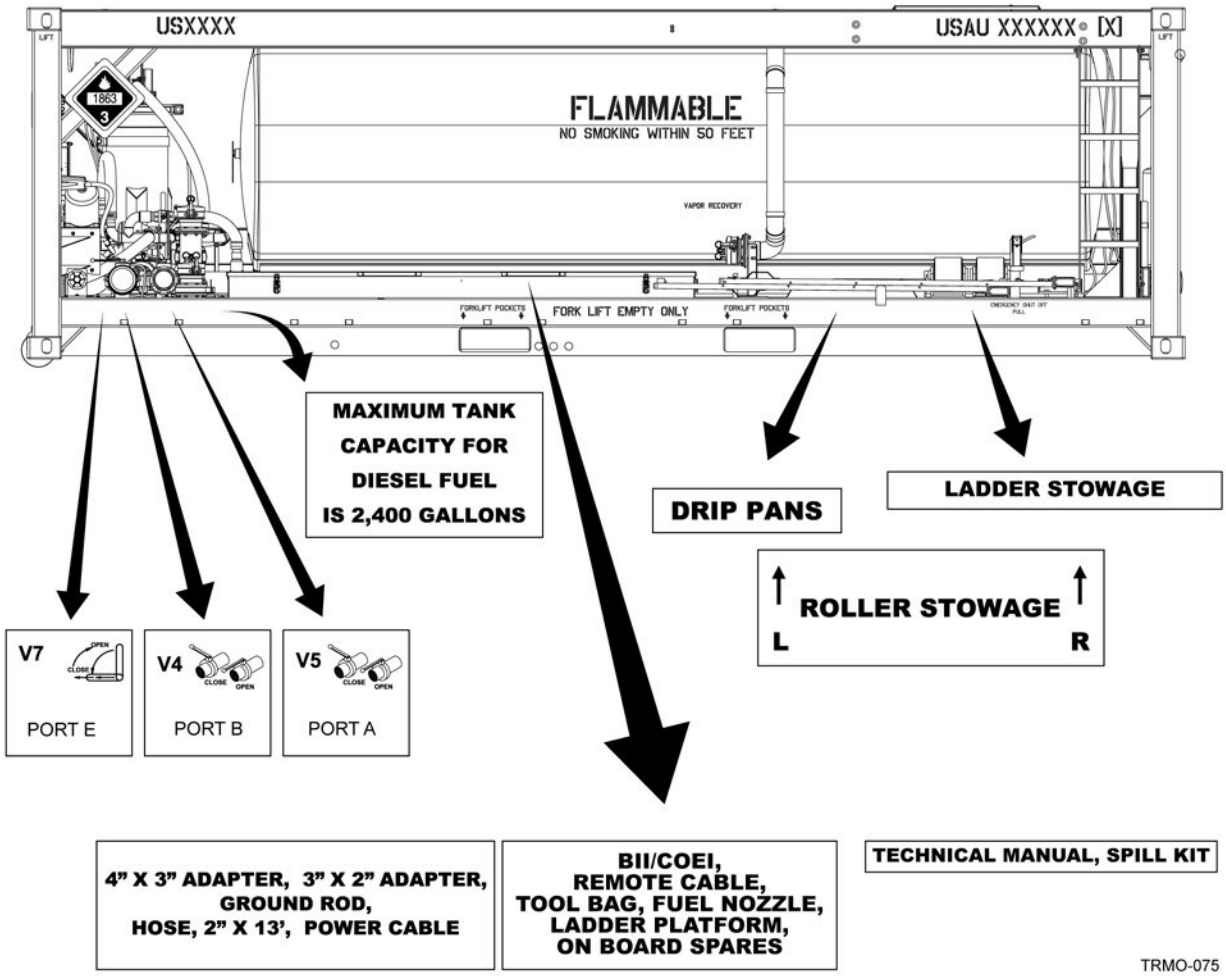


Figure 6. Data Plates (Sheet 1 of 10) .

EQUIPMENT DATA - Continued

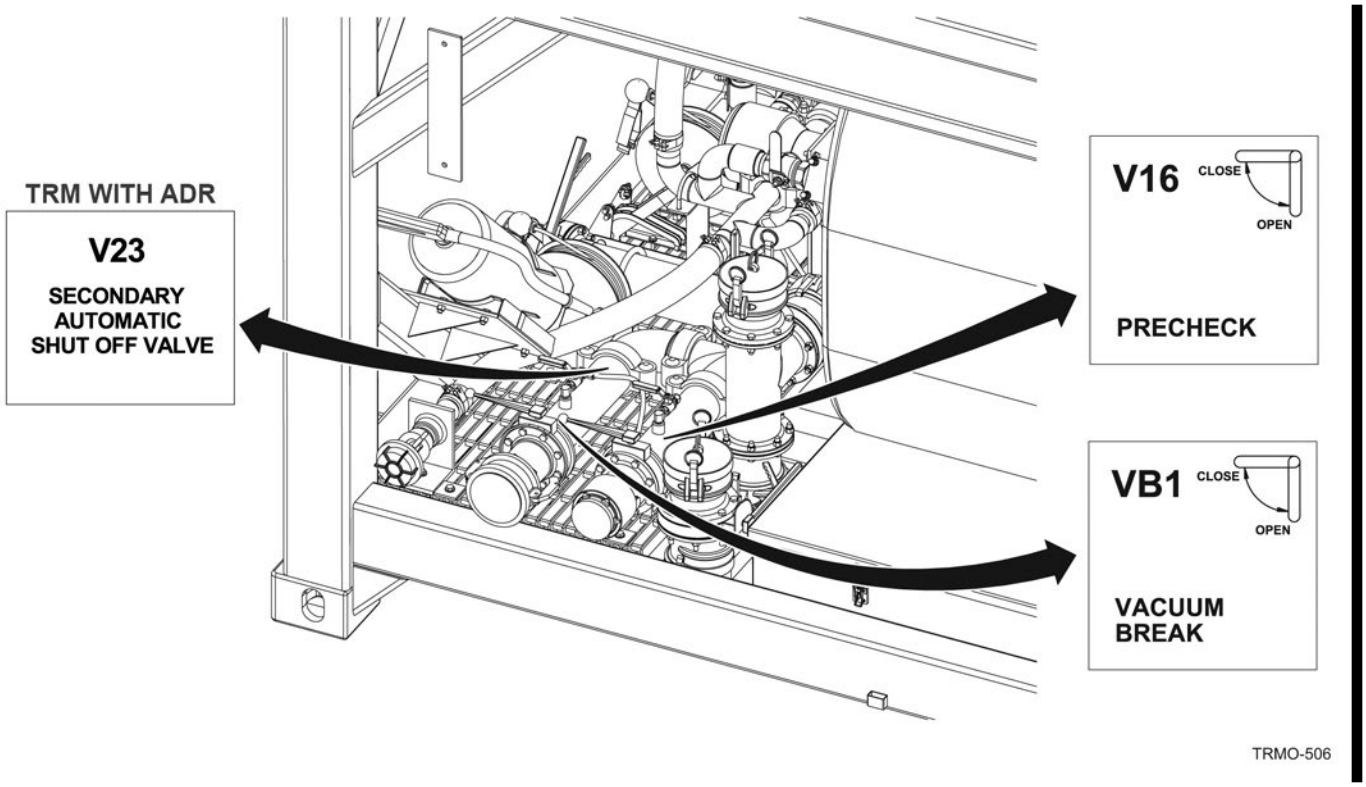


Figure 6. Data Plates (Sheet 2 of 10) .

EQUIPMENT DATA - Continued

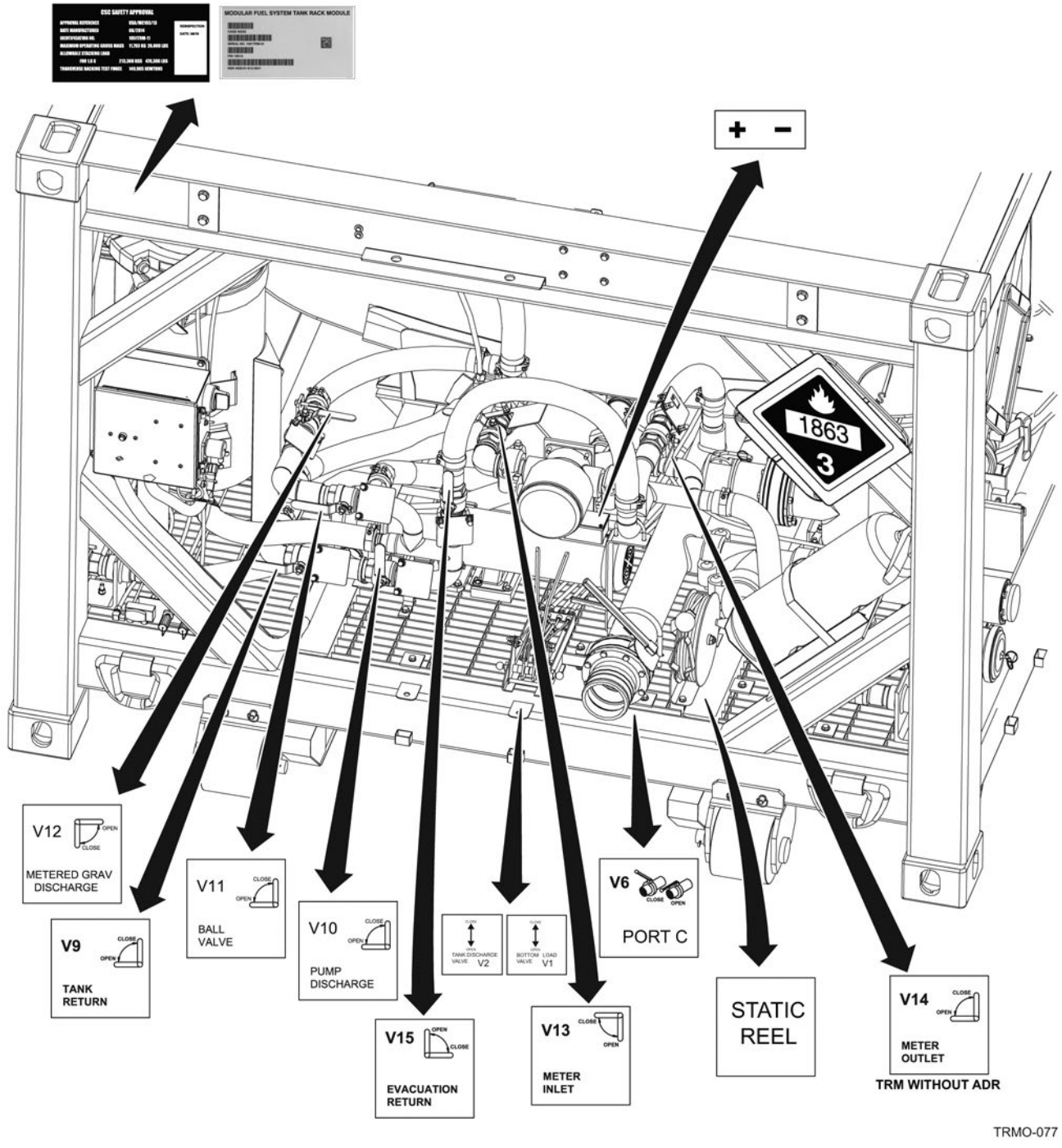


Figure 6. Data Plates (Sheet 3 of 10) .

EQUIPMENT DATA - Continued

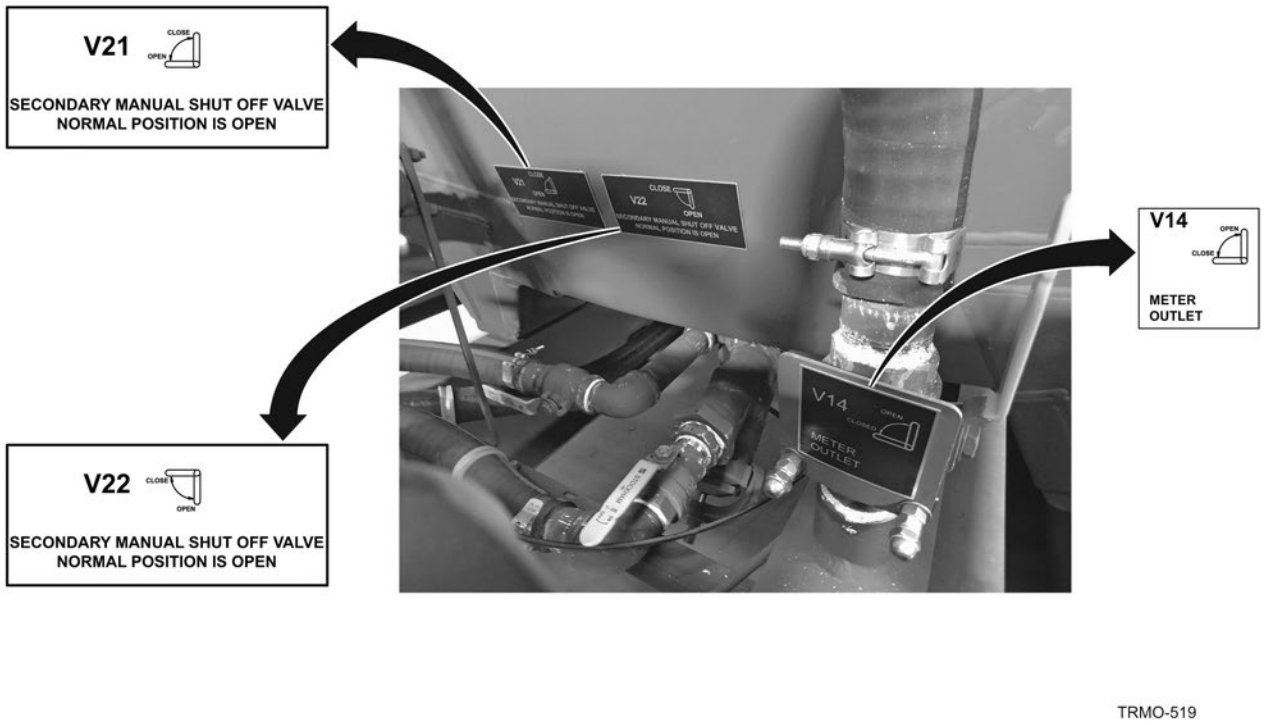


Figure 6. Data Plates (Sheet 4 of 10) .

EQUIPMENT DATA - Continued

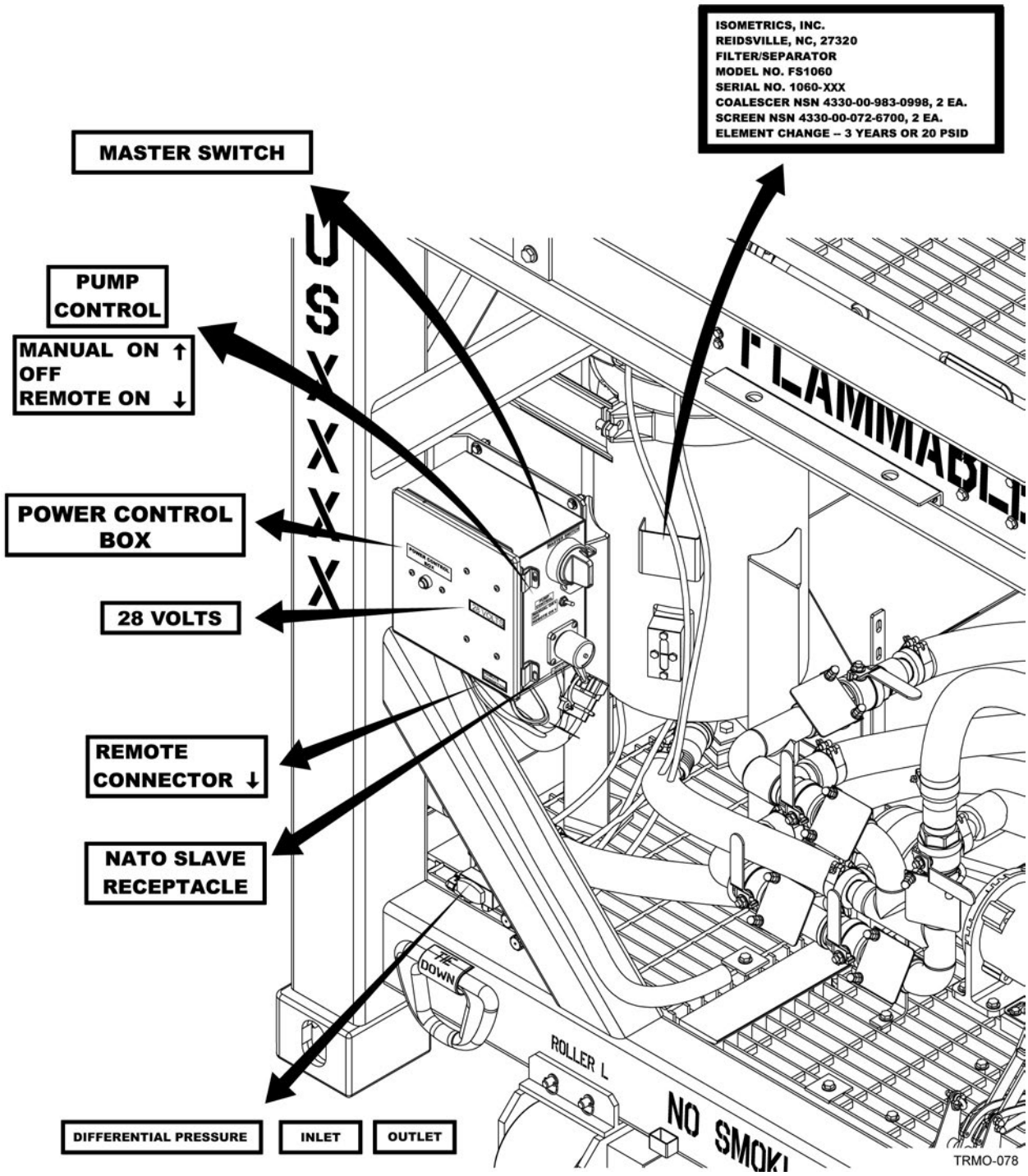


Figure 6. Data Plates (Sheet 5 of 10) .

EQUIPMENT DATA - Continued

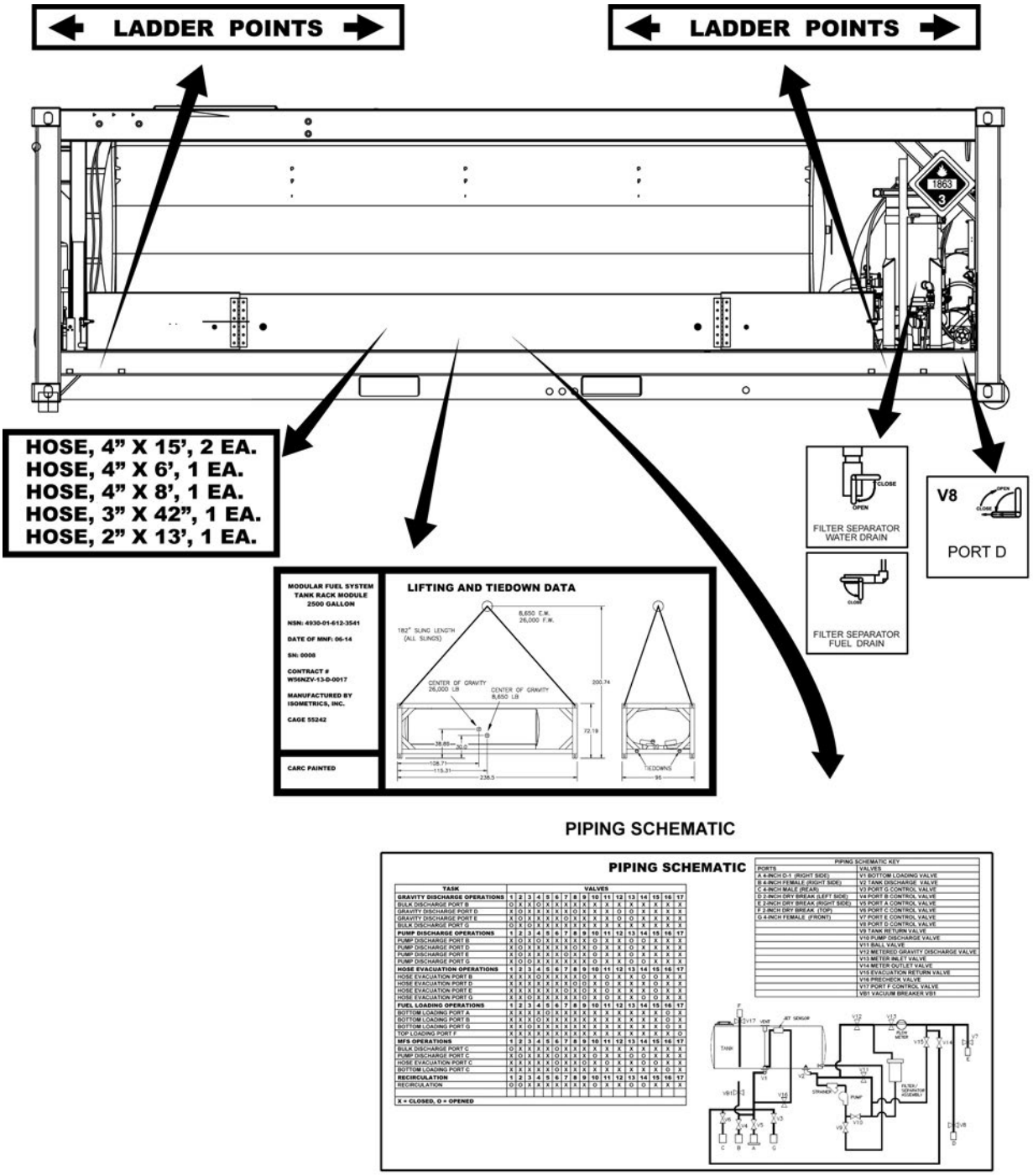


Figure 6. Data Plates (Sheet 6 of 10) .

EQUIPMENT DATA - Continued

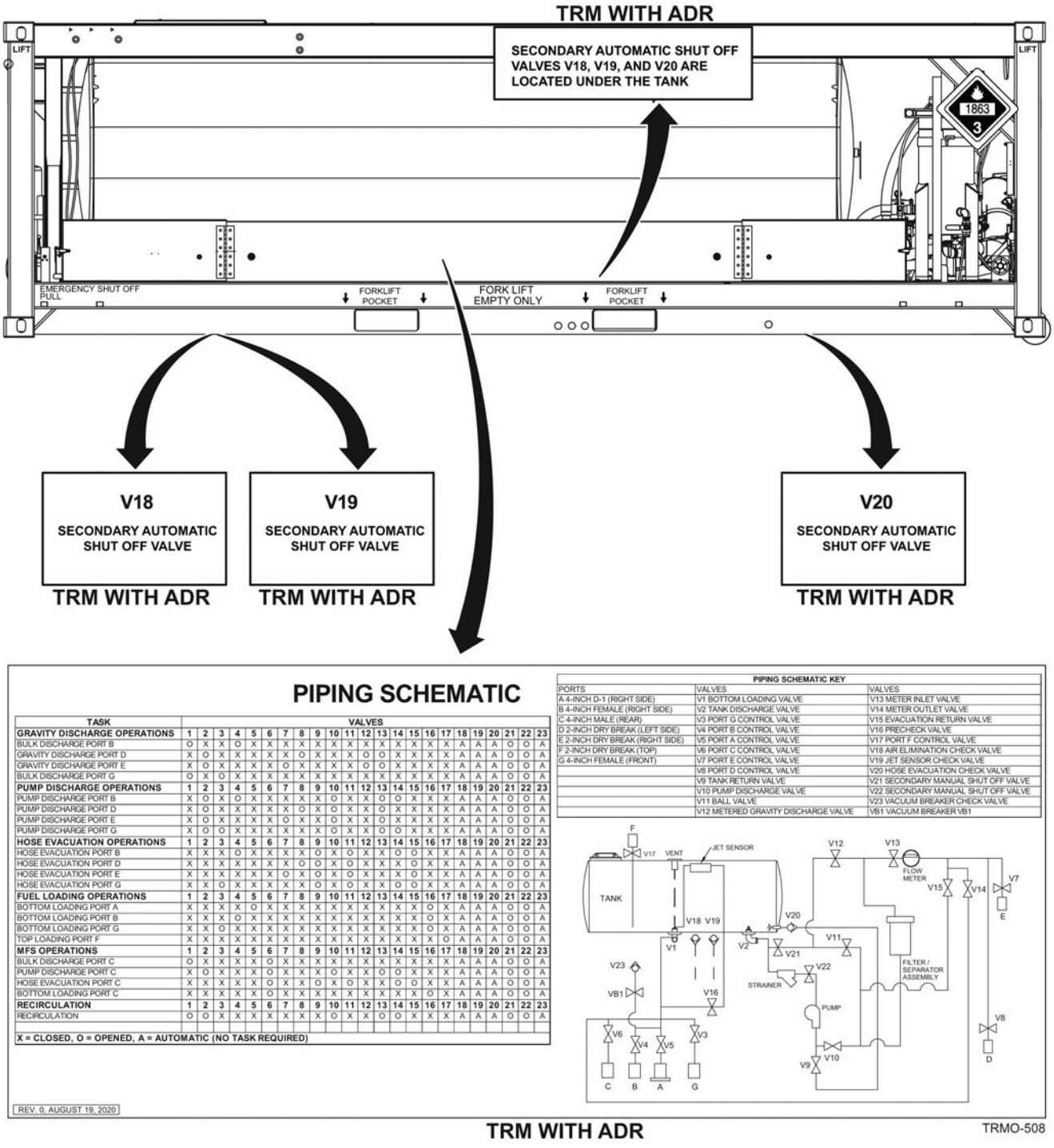

TRM WITH ADR
SECONDARY AUTOMATIC SHUT OFF VALVES V18, V19, AND V20 ARE LOCATED UNDER THE TANK
LIFT
LIFT
1863
3
EMERGENCY SHUT OFF PULL
FORKLIFT POCKET
FORK LIFT EMPTY ONLY
FORKLIFT POCKET
V18
SECONDARY AUTOMATIC SHUT OFF VALVE
TRM WITH ADR
V19
SECONDARY AUTOMATIC SHUT OFF VALVE
TRM WITH ADR
V20
SECONDARY AUTOMATIC SHUT OFF VALVE
TRM WITH ADR
PIPING SCHEMATIC
PIPING SCHEMATIC KEY
PORTS
VALVES
VALVES
A 4-INCH D-1 (RIGHT SIDE)
V1 BOTTOM LOADING VALVE
V13 METER INLET VALVE
B 4-INCH FEMALE (RIGHT SIDE)
V2 TANK DISCHARGE VALVE
V14 METER OUTLET VALVE
C 4-INCH MALE (REAR)
V3 PORT G CONTROL VALVE
V15 EVACUATION RETURN VALVE
D 2-INCH DRY BREAK (LEFT SIDE)
V4 PORT B CONTROL VALVE
V16 PRECHECK VALVE
E 2-INCH DRY BREAK (RIGHT SIDE)
V5 PORT A CONTROL VALVE
V17 PORT F CONTROL VALVE
F 2-INCH DRY BREAK (TOP)
V6 PORT C CONTROL VALVE
V18 AIR ELIMINATION CHECK VALVE
G 4-INCH FEMALE (FRONT)
V7 PORT E CONTROL VALVE
V19 JET SENSOR CHECK VALVE
V8 PORT D CONTROL VALVE
V20 HOSE EVACUATION CHECK VALVE
V9 TANK RETURN VALVE
V21 SECONDARY MANUAL SHUT OFF VALVE
V10 PUMP DISCHARGE VALVE
V22 SECONDARY MANUAL SHUT OFF VALVE
V11 BALL VALVE
V23 VACUUM BREAKER CHECK VALVE
V12 METERED GRAVITY DISCHARGE VALVE
VB1 VACUUM BREAKER VB1
TASK
VALVES
GRAVITY DISCHARGE OPERATIONS 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
BULK DISCHARGE PORT B O X X O X X X X X X X X X X X A A A O O A
GRAVITY DISCHARGE PORT D X O X X X X X O X X X O O X X X A A A O O A
GRAVITY DISCHARGE PORT E X O X X X X O X X X X O O X X X A A A O O A
BULK DISCHARGE PORT G O X O X X X X X X X X X X X X X A A A O O A
PUMP DISCHARGE OPERATIONS 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
PUMP DISCHARGE PORT B X O X O X X X X X O X X O O X X X A A A O O A
PUMP DISCHARGE PORT D X O X X X X X O X O X X O X X X X A A A O O A
PUMP DISCHARGE PORT E X O X X X X O X X X O X O X X X A A A O O A
PUMP DISCHARGE PORT G X O O X X X X X O X X O O X X X A A A O O A
HOSE EVACUATION OPERATIONS 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
HOSE EVACUATION PORT B X X X O X X X X O X O X X O O X X X A A A O O A
HOSE EVACUATION PORT D X X X X X X X O O X O X X O X X X A A A O O A
HOSE EVACUATION PORT E X X X X X X X O X O X O X X O X X X A A A O O A
HOSE EVACUATION PORT G X X O X X X X X O X O X X O O X X X A A A O O A
FUEL LOADING OPERATIONS 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
BOTTOM LOADING PORT A X X X X O X X X X X X X X X X O X X A A A O O A
BOTTOM LOADING PORT B X X X O X X X X X X X X X X X O X X A A A O O A
BOTTOM LOADING PORT G X X O X X X X X X X X X X X X O X X A A A O O A
TOP LOADING PORT F X X X X X X X X X X X X X X X O X X A A A O O A
MFS OPERATIONS 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
BULK DISCHARGE PORT C O X X X X O X X X X X X X X X X X X A A A O O A
PUMP DISCHARGE PORT C X O X X X X O X X X O X X O O X X X A A A O O A
HOSE EVACUATION PORT C X X X X X X O X X O X O X X O X X X A A A O O A
BOTTOM LOADING PORT C X X X X X X O X X X X X X X X O X X A A A O O A
RECIRCULATION 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
RECIRCULATION O O X X X X X X X O X X O O X X X A A A O O A
X = CLOSED, O = OPENED, A = AUTOMATIC (NO TASK REQUIRED)
REV. 0, AUGUST 19, 2020
F
V17
VENT
JET SENSOR
TANK
V18 V19
V1
V2
V20
V12
V13
FLOW METER
V15
V14
V7
E
V11
V21
V22
FILTER / SEPARATOR ASSEMBLY
STRAINER
V23
VB1
V16
PUMP
V8
D
V6
V4
V5
V3
V9
V10
C
B
A
G
TRM WITH ADR
TRMO-508

Figure 6. Data Plates (Sheet 7 of 10) .

EQUIPMENT DATA - Continued

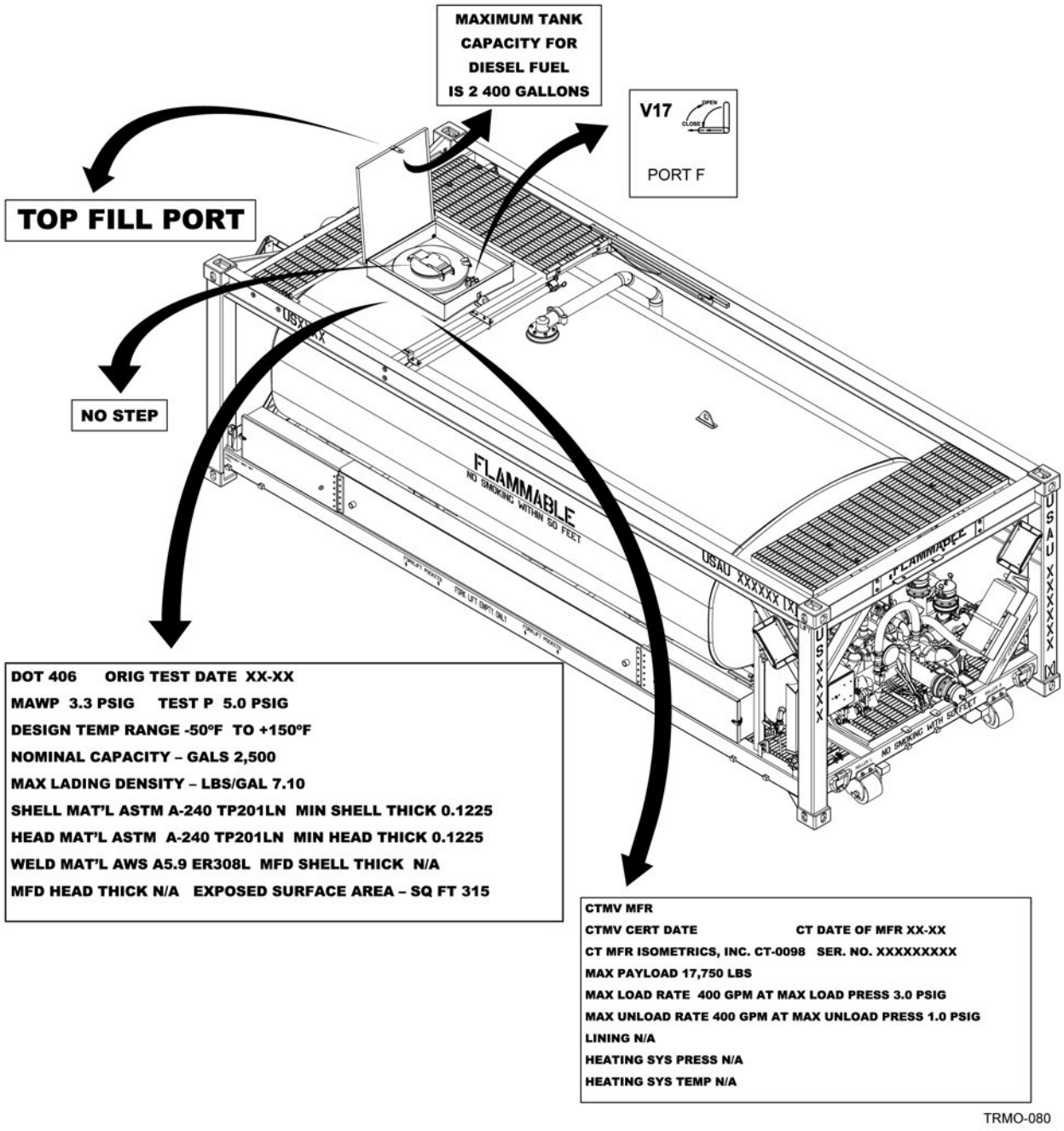

MAXIMUM TANK CAPACITY FOR DIESEL FUEL IS 2 400 GALLONS
V17
PORT F
TOP FILL PORT
NO STEP
FLAMMABLE
NO SMOKING WITHIN 50 FEET
DOT 406 ORIG TEST DATE XX-XX
MAWP 3.3 PSIG TEST P 5.0 PSIG
DESIGN TEMP RANGE -50°F TO +150°F
NOMINAL CAPACITY – GALS 2,500
MAX LADING DENSITY – LBS/GAL 7.10
SHELL MAT'L ASTM A-240 TP201LN MIN SHELL THICK 0.1225
HEAD MAT'L ASTM A-240 TP201LN MIN HEAD THICK 0.1225
WELD MAT'L AWS A5.9 ER308L MFD SHELL THICK N/A
MFD HEAD THICK N/A EXPOSED SURFACE AREA – SQ FT 315
CTMV MFR
CTMV CERT DATE CT DATE OF MFR XX-XX
CT MFR ISOMETRICS, INC. CT-0098 SER. NO. XXXXXXXXX
MAX PAYLOAD 17,750 LBS
MAX LOAD RATE 400 GPM AT MAX LOAD PRESS 3.0 PSIG
MAX UNLOAD RATE 400 GPM AT MAX UNLOAD PRESS 1.0 PSIG
LINING N/A
HEATING SYS PRESS N/A
HEATING SYS TEMP N/A
TRMO-080

Figure 6. Data Plates (Sheet 8 of 10) .

EQUIPMENT DATA - Continued

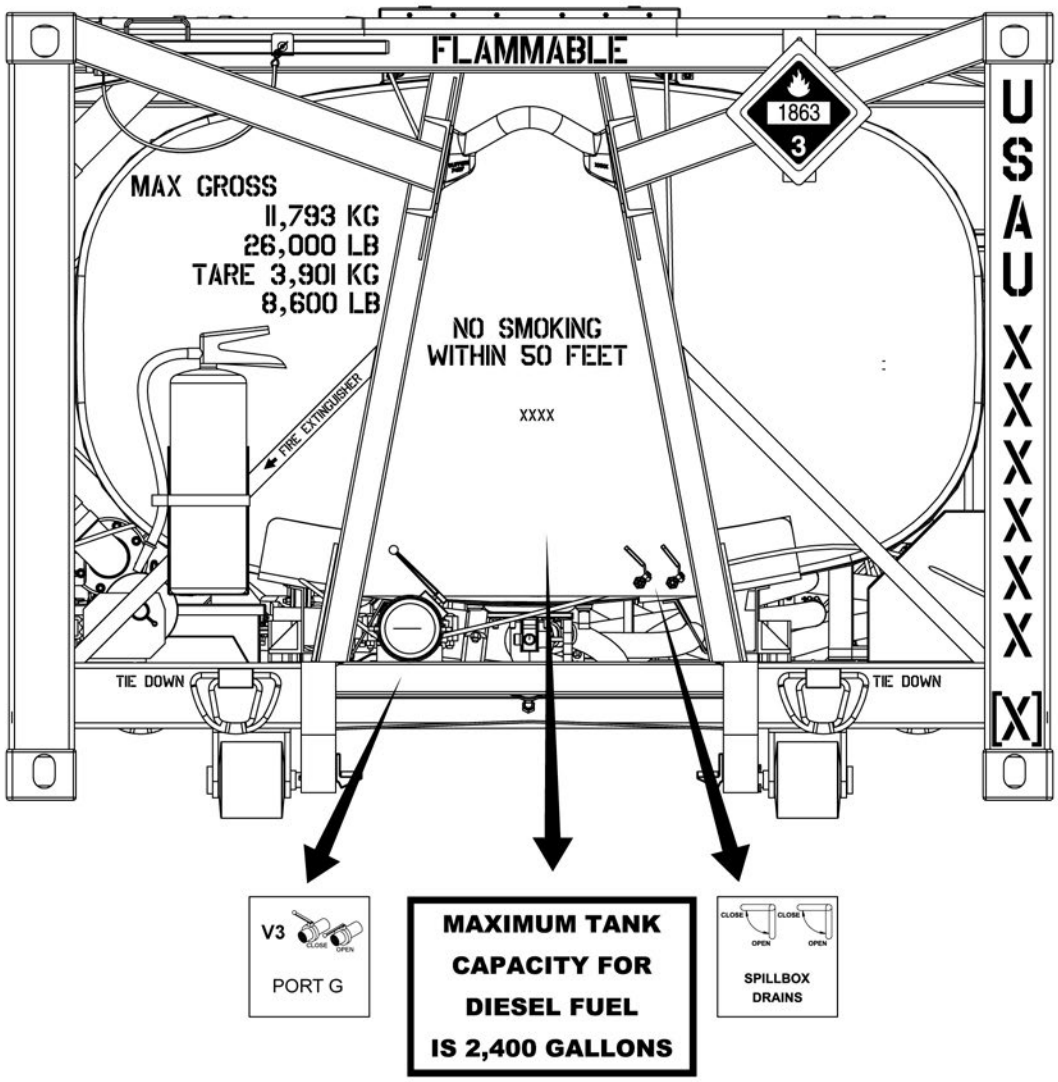


Figure 6. Data Plates (Sheet 9 of 10) .

EQUIPMENT DATA - Continued

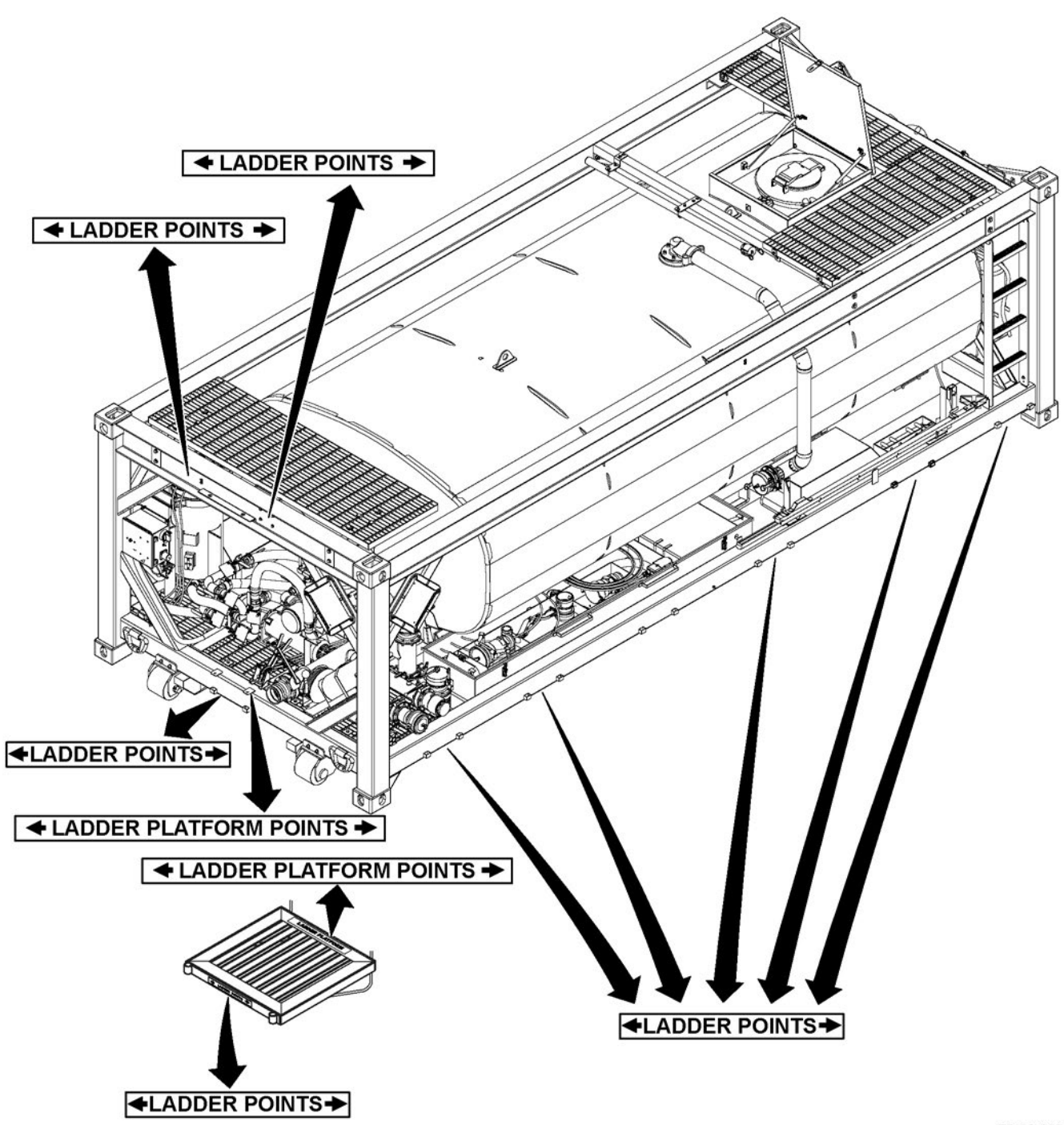


Figure 6. Data Plates (Sheet 10 of 10) .

EQUIPMENT DATA - Continued

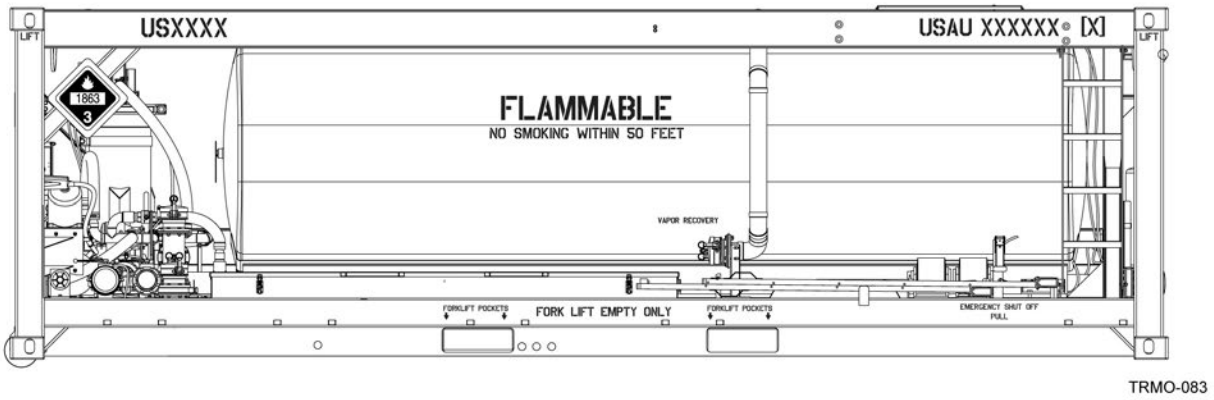


Figure 7. Stencils (Sheet 1 of 6) .

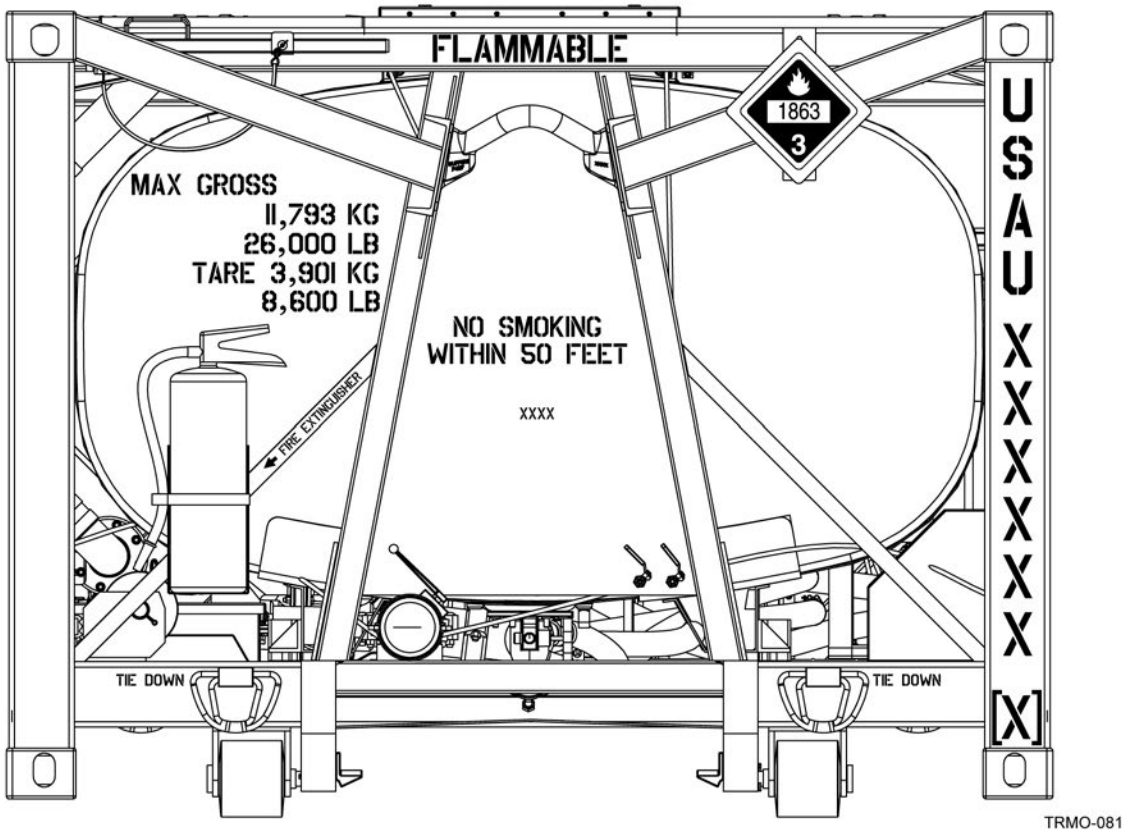


Figure 7. Stencils (Sheet 2 of 6) .

EQUIPMENT DATA - Continued

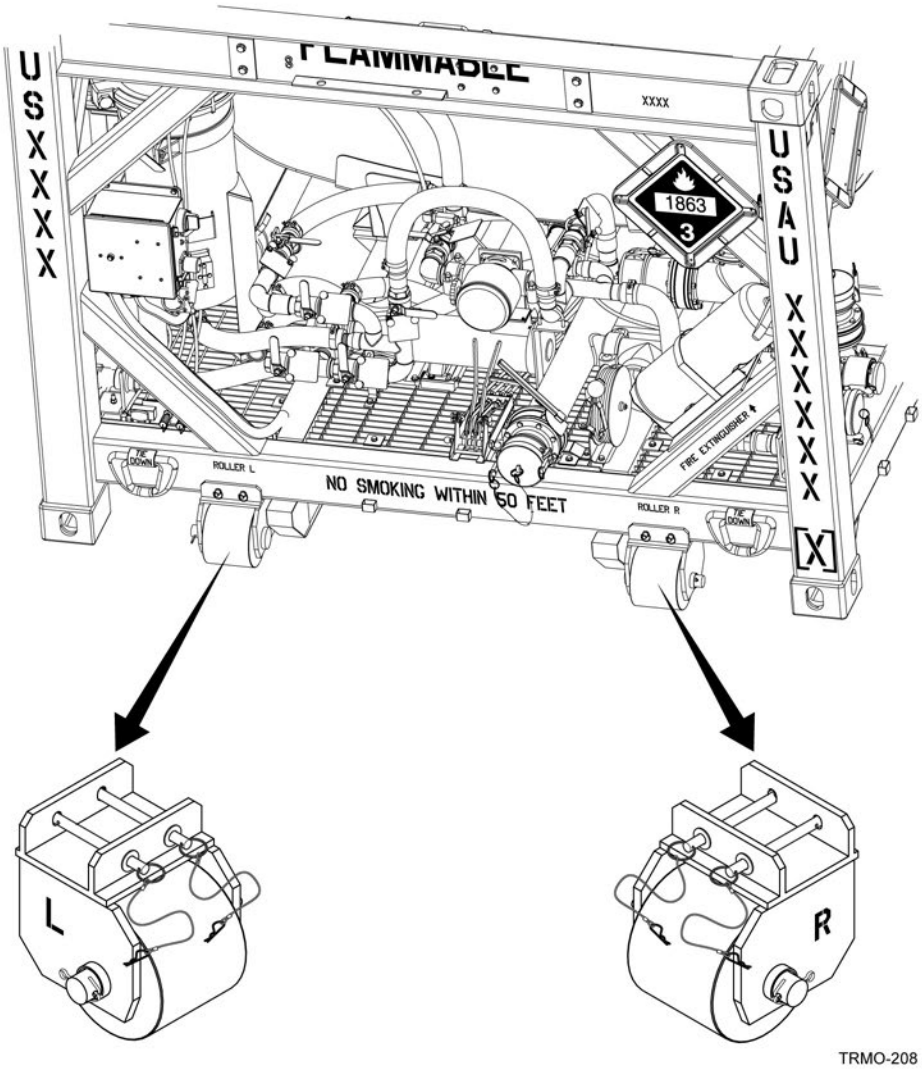


Figure 7. Stencils (Sheet 3 of 6) .

EQUIPMENT DATA - Continued

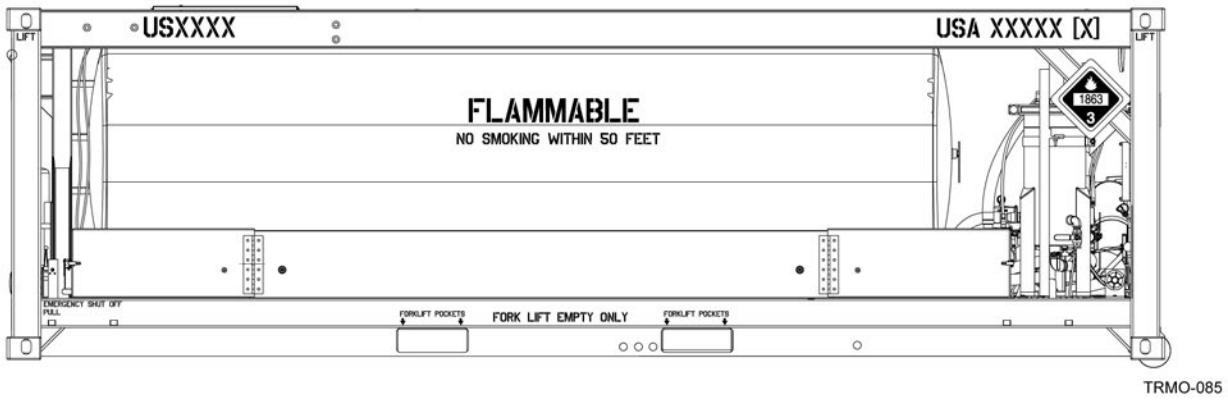


Figure 7. Stencils (Sheet 4 of 6) .

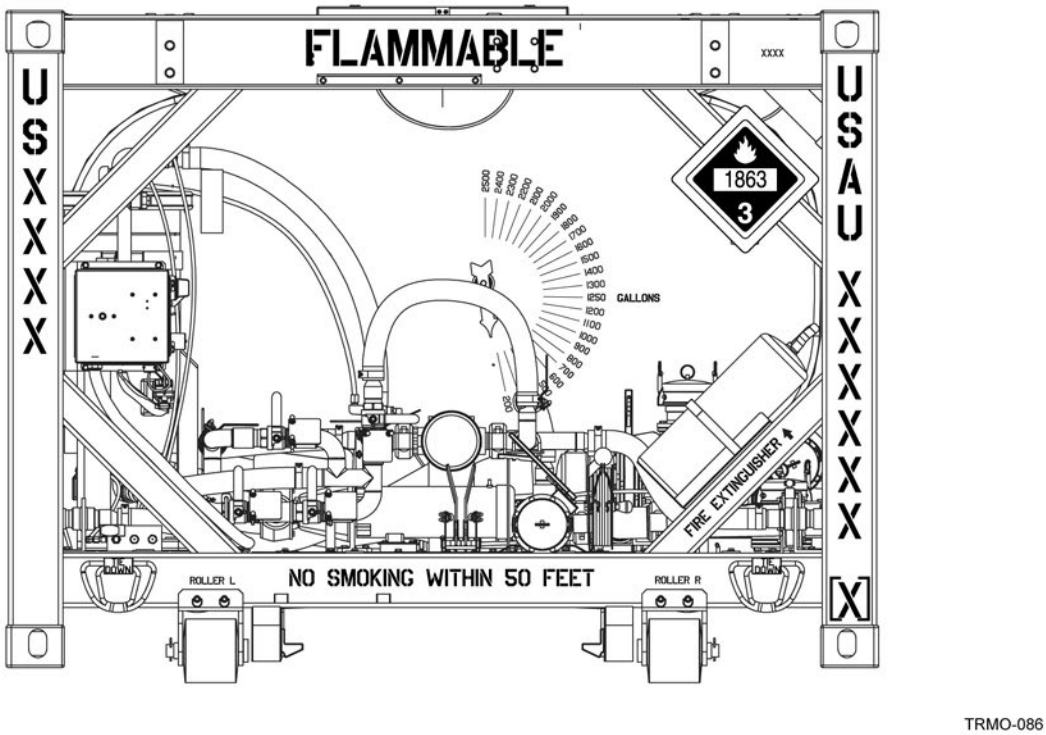


Figure 7. Stencils (Sheet 5 of 6) .

EQUIPMENT DATA - Continued

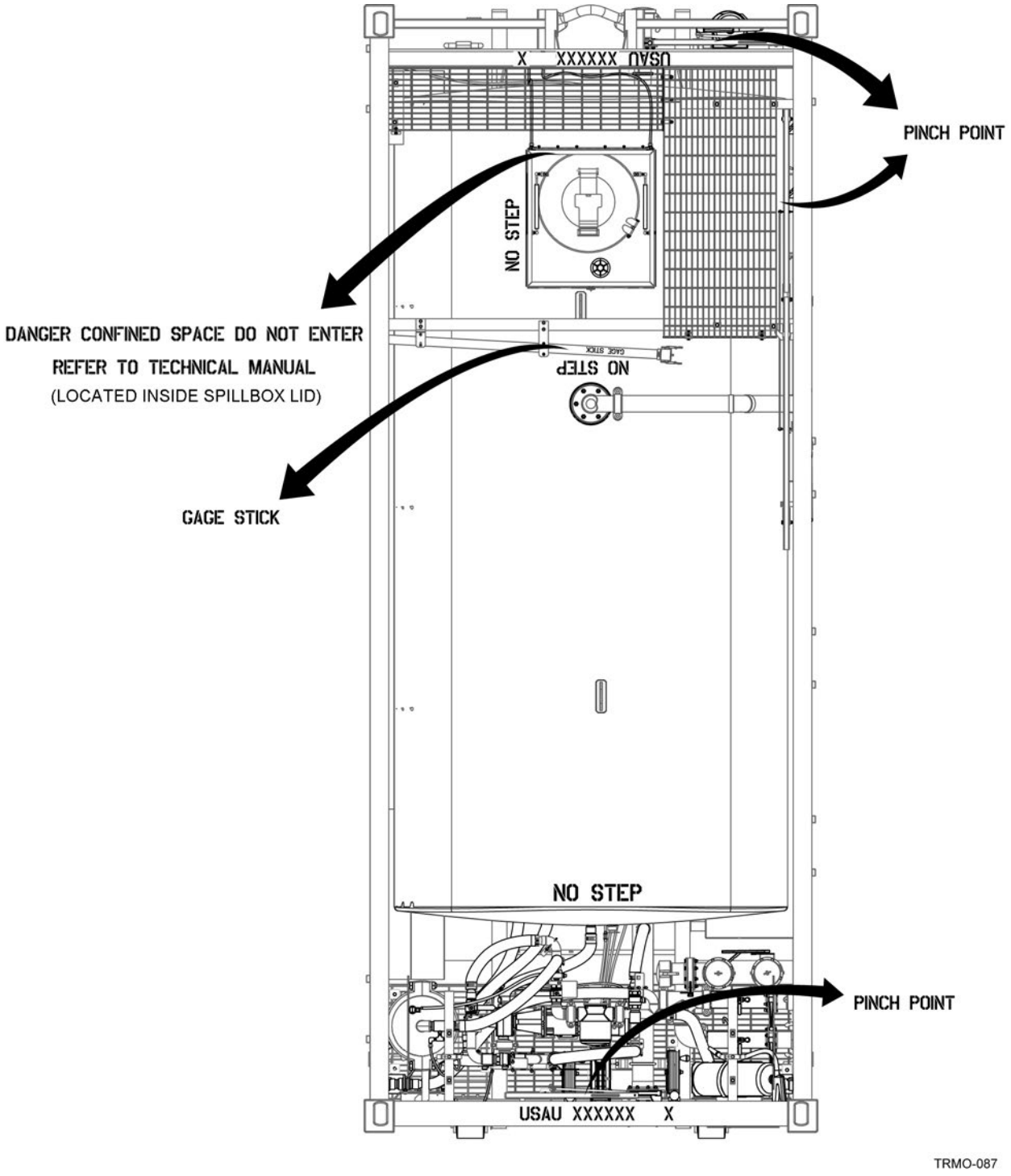


Figure 7. Stencils (Sheet 6 of 6) .

END OF WORK PACKAGE

MAINTAINER
THEORY OF OPERATION

INTRODUCTION

The MFS TRM provides fuel distribution and storage capability at any location. These capabilities can be provided regardless of the availability of construction equipment or material handling equipment. A HEMTT with LHS or PLS can transport the MFS TRM and position the system upon arrival.

The MFS TRM can be used for line haul of fuel throughout the theater. A PLS or HEMTT-LHS can transport two MFS TRMs – one on the truck and one on the PLS trailer – for a total of up to 5,000 gal. (18,928 L) of fuel. HEMTT Fueler (2,500 gal., 9,464 L) can tow a PLS trailer with the MFS TRM to transport a total of 5,000 gal. (18,928 L).

The MFS TRM consists of an enhanced flat rack to provide the required interface with the HEMTT-LHS truck, PLS truck, and PLS trailer. The MFS TRM fittings, fueling nozzle, and other ancillary items are compatible with and are currently in inventory for various other fuel handling systems.

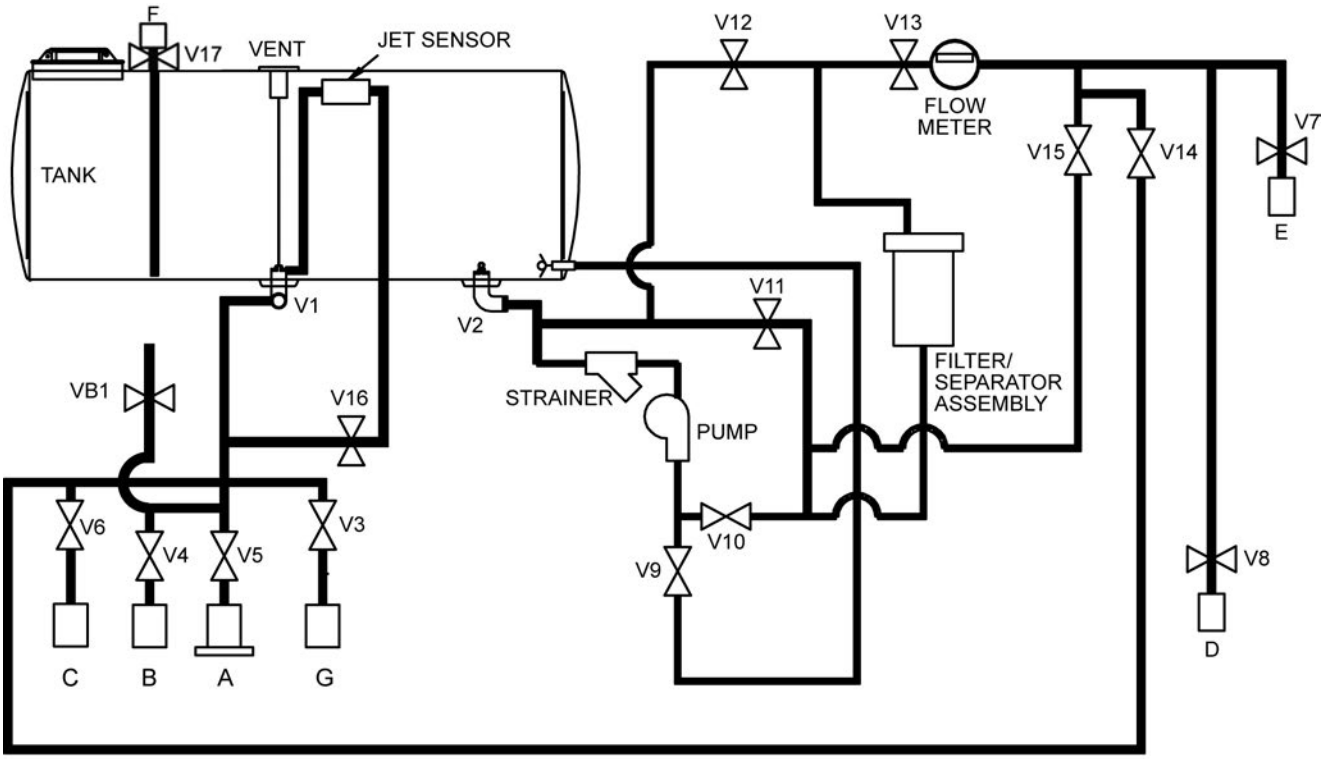
The MFS TRM provides a variety of types of ports and can be offloaded using the on-board electric pump or using gravity discharge. Loading the MFS TRM can be accomplished via the top or bottom loading ports. The MFS TRM can also recirculate fuel through the filter/separator assembly, or can be used in a recirculating mode as either an issuing tank or receiving tank.

The MFS TRM contains:

1. Electric pump, valves, flow meter, and manifold for fuel distribution
2. Tank gauge viewable by a soldier standing on the ground
3. Tank gauging stick secured on top of the tank
4. Filter/Separator for eliminating water and other contaminants from fuel
5. Piping manifolds
6. Secure storage for hoses, fueling nozzle, adapters, and other ancillary equipment
7. Storage for other equipment necessary for maintenance and refueling operations
8. Emergency shutoff controls, fire extinguishers, and static reel for safety purposes
9. Stowable ladder that can be used to access the top of the MFS TRM and the components of the MFS TRM when mounted on the trailer. Ladder is also used to access rear catwalk when MFS TRM is on the ground

Figure 1 shows the piping schematic for the TRM without ADR.

INTRODUCTION - Continued



VALVES

V1 BOTTOM LOADING VALVE
V2 TANK DISCHARGE VALVE
V3 PORT G CONTROL VALVE
V4 PORT B CONTROL VALVE
V5 PORT A CONTROL VALVE
V6 PORT C CONTROL VALVE
V7 PORT E CONTROL VALVE
V8 PORT D CONTROL VALVE
V9 TANK RETURN VALVE
V10 PUMP DISCHARGE VALVE
V11 BALL VALVE
V12 METERED GRAVITY DISCHARGE VALVE
V13 METER INLET VALVE
V14 METER OUTLET VALVE
V15 EVACUATION RETURN VALVE
V16 PRECHECK VALVE
V17 PORT F CONTROL VALVE
VB1 VACUUM BREAKER VB1

PORTS

A 4-INCH D-1 (RIGHT SIDE)
B 4-INCH FEMALE (RIGHT SIDE)
C 4-INCH MALE (REAR)
D 2-INCH DRY BREAK (LEFT SIDE)
E 2-INCH DRY BREAK (RIGHT SIDE)
F 2-INCH DRY BREAK (TOP)
G 4-INCH FEMALE (FRONT)

TRMO-006

Figure 1. TRM Without ADR Piping Schematic Diagram.

INTRODUCTION - Continued

PIPING SCHEMATIC KEY		
PORTS	VALVES	VALVES
A 4-INCH D-1 (RIGHT SIDE)	V1 BOTTOM LOADING VALVE	V13 METER INLET VALVE
B 4-INCH FEMALE (RIGHT SIDE)	V2 TANK DISCHARGE VALVE	V14 METER OUTLET VALVE
C 4-INCH MALE (REAR)	V3 PORT G CONTROL VALVE	V15 EVACUATION RETURN VALVE
D 2-INCH DRY BREAK (LEFT SIDE)	V4 PORT B CONTROL VALVE	V16 PRECHECK VALVE
E 2-INCH DRY BREAK (RIGHT SIDE)	V5 PORT A CONTROL VALVE	V17 PORT F CONTROL VALVE
F 2-INCH DRY BREAK (TOP)	V6 PORT C CONTROL VALVE	V18 AIR ELIMINATION CHECK VALVE
G 4-INCH FEMALE (FRONT)	V7 PORT E CONTROL VALVE	V19 JET SENSOR CHECK VALVE
	V8 PORT D CONTROL VALVE	V20 HOSE EVACUATION CHECK VALVE
	V9 TANK RETURN VALVE	V21 SECONDARY MANUAL SHUT OFF VALVE
	V10 PUMP DISCHARGE VALVE	V22 SECONDARY MANUAL SHUT OFF VALVE
	V11 BALL VALVE	V23 VACUUM BREAKER CHECK VALVE
	V12 METERED GRAVITY DISCHARGE VALVE	VB1 VACUUM BREAKER VB1

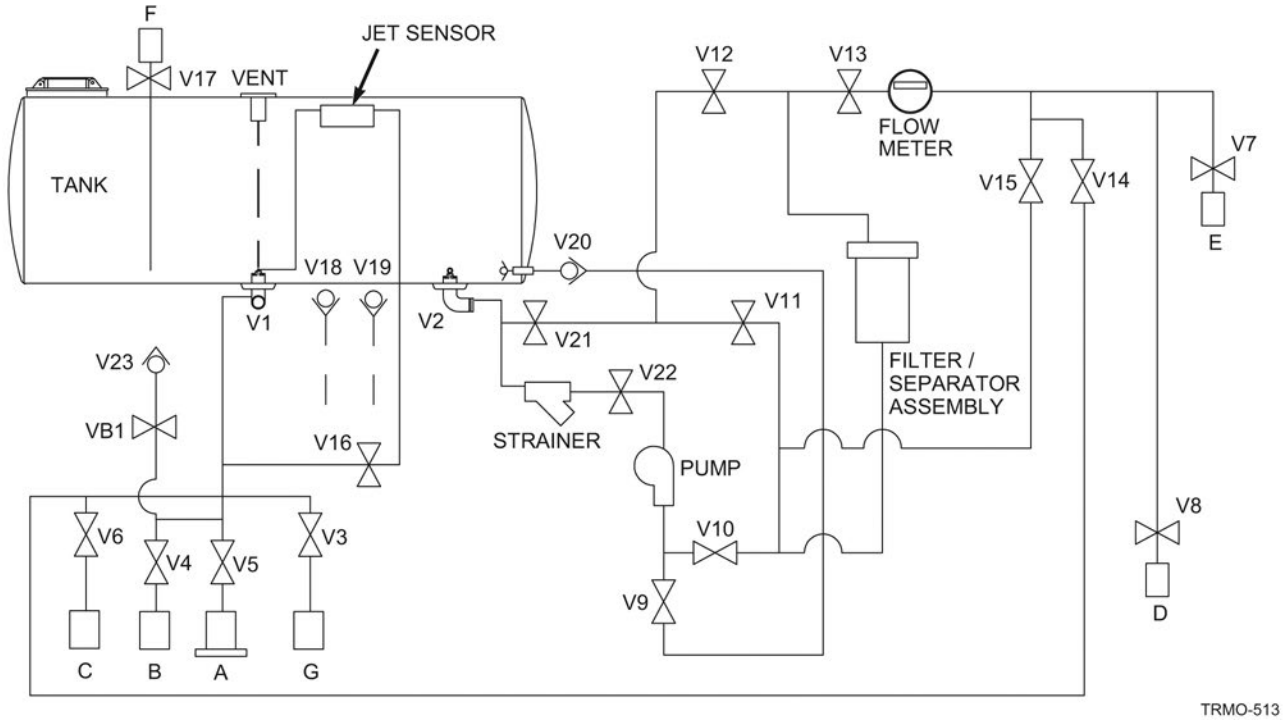


Figure 2. TRM With ADR Piping Schematic Diagram.

END OF WORK PACKAGE

CHAPTER 2

TROUBLESHOOTING PROCEDURES

MAINTAINER TROUBLESHOOTING
TROUBLESHOOTING INTRODUCTION

NOTE

Review the associated maintenance procedure(s) and determine the amount of disassembly required to perform a test or inspection before beginning a troubleshooting procedure. Disassemble components only as far as necessary to test/inspect/replace the damaged, broken, or faulty component.

INTRODUCTION

This chapter provides the information necessary for identifying and correcting symptoms that may develop during operation of the MFS TRM.

If you are unsure of the location of an item mentioned in troubleshooting, refer to Equipment Description and Data (WP 0002).

Ensure all Operator PMCS have been performed (TM 10-4930-371-10) before starting any troubleshooting procedure.

Ensure all Operator troubleshooting procedures have been performed (TM 10-4930-371-10) before starting Maintainer troubleshooting.

Read and follow all safety instructions found in the Warning Summary at the front of this manual before starting any troubleshooting procedure.

The Troubleshooting Index (WP 0005) lists common symptoms that may occur and refers to the proper work package.

The Troubleshooting Index (WP 0005) cannot list all possible symptoms that may occur, nor can troubleshooting list all test and corrective actions.

NOTE

This troubleshooting process requires the user to automatically proceed to the next applicable malfunction until the symptom is resolved; provided the corrective action does not correct the malfunction.

When troubleshooting, perform the following actions:

Locate the symptom in the Troubleshooting Index (WP 0005) that best describes the symptom.

Review applicable schematics before troubleshooting the MFS TRM.

Read each step before performing the troubleshooting procedure. Most troubleshooting procedures require isolation and testing of multiple components. To achieve this, the troubleshooting logic procedure is broken down as follows:

Step. Each step contains a sequence number and an action to perform to carry out the diagnostic process (e.g., Step 1. Turn ignition switch ON [TM 10-4930-371-10]). The step may have bulleted or sequenced sub-steps in order to perform the actions in the parent step. Each sequenced step may be followed by another step or a Condition/Indication.

Condition/Indication. Each condition/indication will usually be in the form of a statement of abnormal condition, and is based on the action in the preceding steps (e.g., Both brake lights are not on.). When an abnormal condition or indication is observed, a corrective action is provided. When a condition/indication is used, a correction action will always follow. There may be multiple condition/indication and correct actions after a step. If the correct condition/indication is observed, proceed to the next step until all steps have been performed. If the

INTRODUCTION - Continued

correct condition/indication is always observed, the operational checkout is complete, and no further troubleshooting is required.

Decision. A decision will usually be “YES” or “NO” but may also be “PASS, FAIL, TRUE, or NOT TRUE”. The positive and negative responses will always be paired in the decision. The result from each decision will direct a repair, continue troubleshooting to the next step, another step or refer to another troubleshooting procedure. If the decision results in a repair, connect all wiring harness connectors, and install components removed/disassembled to perform the troubleshooting procedure. If sent to a troubleshooting procedure from an operational checkout, return to the operational checkout to verify system operation.

Malfunction. Each malfunction will be a descriptive statement identifying the malfunction (e.g. Coolant level low). There may be multiple malfunctions for each symptom. Each malfunction is followed by a corrective action.

Action. When using an operational checkout with troubleshooting, a corrective action may be a limited repair action (e.g., Replace pump assembly (WP 0080)) or a reference to a troubleshooting procedure.

END OF WORK PACKAGE

MAINTAINER TROUBLESHOOTING
TROUBLESHOOTING INDEX

Malfunction/Symptom **Troubleshooting Procedure**

CONNECTION AND LEAK MALFUNCTIONS

1. BOTTOM LOADING VALVE (V1) LEAKS AT GASKET TROUBLESHOOTING PROCEDURE..... WP 0016
2. CANNOT CONNECT 4-INCH, 2-INCH, OR HEMTT HOSE ASSEMBLY TO COMPONENTS TROUBLESHOOTING PROCEDURE..... WP 0037
3. CANNOT CONNECT COMPONENTS TO CAMLOCK COUPLING (PORT B, PORT G, OR PORT C) TROUBLESHOOTING PROCEDURE..... WP 0031
4. CANNOT CONNECT COMPONENTS TO DRY BREAK COUPLING (PORT D, PORT E, OR PORT F) TROUBLESHOOTING PROCEDURE..... WP 0032
5. CANNOT CONNECT COMPONENTS TO PORT A TROUBLESHOOTING PROCEDURE..... WP 0033
6. CANNOT CONNECT COMPONENTS TO QUICK DISCONNECT REDUCER, OR QUICK DISCONNECT COUPLING HALF TROUBLESHOOTING PROCEDURE..... WP 0036
7. CANNOT CONNECT COMPONENTS TO VALVE ADAPTER ASSEMBLY OR TEE ASSEMBLY TROUBLESHOOTING PROCEDURE..... WP 0034
8. CANNOT CONNECT NOZZLE ASSEMBLY TO HOSE ASSEMBLY TROUBLESHOOTING PROCEDURE..... WP 0035
9. CANNOT CONNECT REMOTE CONTROL ASSEMBLY TO POWER CONTROL BOX TROUBLESHOOTING PROCEDURE..... WP 0038
10. FUEL LEAKS FROM BALL VALVE ASSEMBLY (V9, V10, V11, V12, V13, V14, V15, V21, OR V22) TROUBLESHOOTING PROCEDURE..... WP 0021
11. FUEL LEAKS FROM FILTER/SEPARATOR ASSEMBLY TROUBLESHOOTING PROCEDURE..... WP 0026
12. FUEL LEAKS FROM FLOW METER ASSEMBLY TROUBLESHOOTING PROCEDURE..... WP 0022
13. FUEL LEAKS FROM MANHOLE ASSEMBLY DURING TRANSPORT TROUBLESHOOTING PROCEDURE..... WP 0015
14. FUEL LEAKS FROM PORT CONTROL VALVE (V3, V4, V5, V6, V7, OR V8) TROUBLESHOOTING PROCEDURE..... WP 0019
15. FUEL LEAKS FROM PORT F (V17) DRY BREAK COUPLING TROUBLESHOOTING PROCEDURE..... WP 0025

- Continued

Malfunction/Symptom	Troubleshooting Procedure

16. FUEL LEAKS FROM PRECHECK VALVE (V16) TROUBLESHOOTING PROCEDURE ..... WP 0023

17. FUEL LEAKS FROM PUMP ASSEMBLY TROUBLESHOOTING PROCEDURE ..... WP 0027

18. FUEL LEAKS FROM RIGHT SIDE PIPING MANIFOLD ASSEMBLY TROUBLESHOOTING PROCEDURE ..... WP 0020

19. FUEL LEAKS FROM STRAINER OR BOTTOM LOADING PIPING ASSEMBLY TROUBLESHOOTING PROCEDURE ..... WP 0018

20. FUEL LEAKS FROM TEE ASSEMBLY TROUBLESHOOTING PROCEDURE ..... WP 0029

21. FUEL LEAKS FROM VACUUM BREAKER (VB1) TROUBLESHOOTING PROCEDURE ..... WP 0024

22. FUEL LEAKS FROM VALVE ADAPTER ASSEMBLY TROUBLESHOOTING PROCEDURE ..... WP 0030

23. FUEL LEAKS FROM VAPOR RECOVERY LINE DURING TRANSPORT OPERATIONS TROUBLESHOOTING PROCEDURE ..... WP 0028

24. TANK DISCHARGE VALVE (V2) LEAKS AT GASKET TROUBLESHOOTING PROCEDURE ..... WP 0017

ELECTRICAL MALFUNCTIONS

25. CIRCUIT BREAKER TRIPS AFTER BEING RESET TROUBLESHOOTING PROCEDURE ..... WP 0007

26. NO POWER AT ELECTRIC MOTOR WITH MANUAL OR REMOTE ON PUMP CONTROL TOGGLE SWITCH TROUBLESHOOTING PROCEDURE ..... WP 0008

FUEL FLOW AND PUMP MALFUNCTIONS

27. AIR DOES NOT BLEED WHEN VACUUM BREAKER (VB1) OPENED TROUBLESHOOTING PROCEDURE ..... WP 0006.3

28. AIR DOES NOT EXPEL BACK TO TANK BUT EXPELS THROUGH PIPING TO OUTLET OR SOME AIR IS EXPELLED TO TANK AND SOME AIR IS EXPELLED OUT THE NOZZLE TROUBLESHOOTING PROCEDURE ..... WP 0006.1

29. FLOW METER ASSEMBLY DOES NOT REGISTER CORRECTLY TROUBLESHOOTING PROCEDURE ..... WP 0014

30. FUEL NOT FLOWING FROM TANK DURING BULK DISCHARGE OPERATIONS TROUBLESHOOTING PROCEDURE. ..... WP 0013

31. FUEL NOT FLOWING FROM TANK DURING GRAVITY DISCHARGE OPERATIONS TROUBLESHOOTING PROCEDURE. ..... WP 0012

32. FUEL NOT FLOWING INTO TANK DURING BOTTOM LOADING OPERATIONS TROUBLESHOOTING PROCEDURE ..... WP 0009

- Continued

Malfunction/Symptom	Troubleshooting Procedure

33. FUEL PUMP ASSEMBLY RUNS BUT FLOW RATE IS LOW TROUBLESHOOTING PROCEDURE ..... WP 0011

34. FUEL PUMP ASSEMBLY RUNS BUT FUEL DOES NOT FLOW FROM THE TANK DISCHARGE VALVE (V2) TROUBLESHOOTING PROCEDURE ..... WP 0010

35. HOSE WILL NOT EVACUATE OR IS SLOW TO EVACUATE TROUBLESHOOTING PROCEDURE ..... WP 0006.2

36. NO FLOW WHEN USING MANUAL OR REMOTE ON PUMP CONTROL TOGGLE SWITCH TROUBLESHOOTING PROCEDURE ..... WP 0006

FUEL LOADING/DISCHARGE OPERATION MALFUNCTIONS

37. CANNOT FULLY OPEN/CLOSE BALL VALVE ASSEMBLY (V9, V10, V11, V12, V13, V14, V15, V21, OR V22) TROUBLESHOOTING PROCEDURE ..... WP 0042

38. CANNOT FULLY OPEN/CLOSE PRECHECK VALVE (V16) OR VACUUM BREAKER (VB1) TROUBLESHOOTING PROCEDURE ..... WP 0043

39. EMERGENCY LEVERS DO NOT OPEN/CLOSE BOTTOM LOADING VALVE (V1) AND/OR TANK DISCHARGE VALVE (V2) TROUBLESHOOTING PROCEDURE ..... WP 0044

40. FUEL DOES NOT FLOW OR DECREASE IN FLOW PRESSURE INTO TANK VIA PORTS A, B, OR G DURING BOTTOM LOAD OPERATIONS TROUBLESHOOTING PROCEDURE ..... WP 0041.1

41. PORT CONTROL BUTTERFLY VALVES (V3, V4, OR V6) DO NOT FULLY OPEN/CLOSE TROUBLESHOOTING PROCEDURE ..... WP 0040

42. VALVE CONTROL LEVERS DO NOT FULLY OPEN/CLOSE BOTTOM LOADING VALVE (V1) OR TANK DISCHARGE VALVE (V2) TROUBLESHOOTING PROCEDURE ..... WP 0039

43. VALVED DRY BREAK COUPLING VALVES (V7, V8, OR V17) DO NOT FULLY OPEN/CLOSE TROUBLESHOOTING PROCEDURE ..... WP 0041

GROUNDING/BONDING MALFUNCTIONS

44. FUEL DISPENSING NOZZLE CAUSES STATIC SPARKS TROUBLESHOOTING PROCEDURE ..... WP 0045

END OF WORK PACKAGE

MAINTAINER TROUBLESHOOTING
NO FLOW WHEN USING MANUAL OR REMOTE ON PUMP CONTROL TOGGLE SWITCH
TROUBLESHOOTING PROCEDURE

INITIAL SETUP:

Tools and Special Tools
Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
Fire extinguisher (TM 10-4930-371-10)

Personnel Required
91J Quartermaster and Chemical Equipment Repairer

References
TM 10-4930-371-10

References (cont.)
Wiring Schematic
WP 0008
WP 0079
WP 0080

Equipment Condition
MFS TRM prepared for use (TM 10-4930-371-10)

Time to Complete
2.0 Hour(s)

GENERAL

This work package contains Maintainer troubleshooting procedures for MFS TRM. Use this work package to help isolate and correct system problems. Ensure all operator PMCS and troubleshooting procedures have been performed.

TROUBLESHOOTING PROCEDURE

NO FLOW WHEN USING MANUAL OR REMOTE ON PUMP CONTROL TOGGLE SWITCH

WARNING

The MFS TRM has 18-30 VDC voltage present at electrical connections. Electrical shock can cause injury or death to personnel. When replacing or servicing any electrical component, disconnect power cable. Failure to comply could result in injury or death to personnel.

NO FLOW WHEN USING MANUAL OR REMOTE ON PUMP CONTROL TOGGLE SWITCH - Continued

STEP

1. Set master switch (Figure 1, Item 1) to ON.

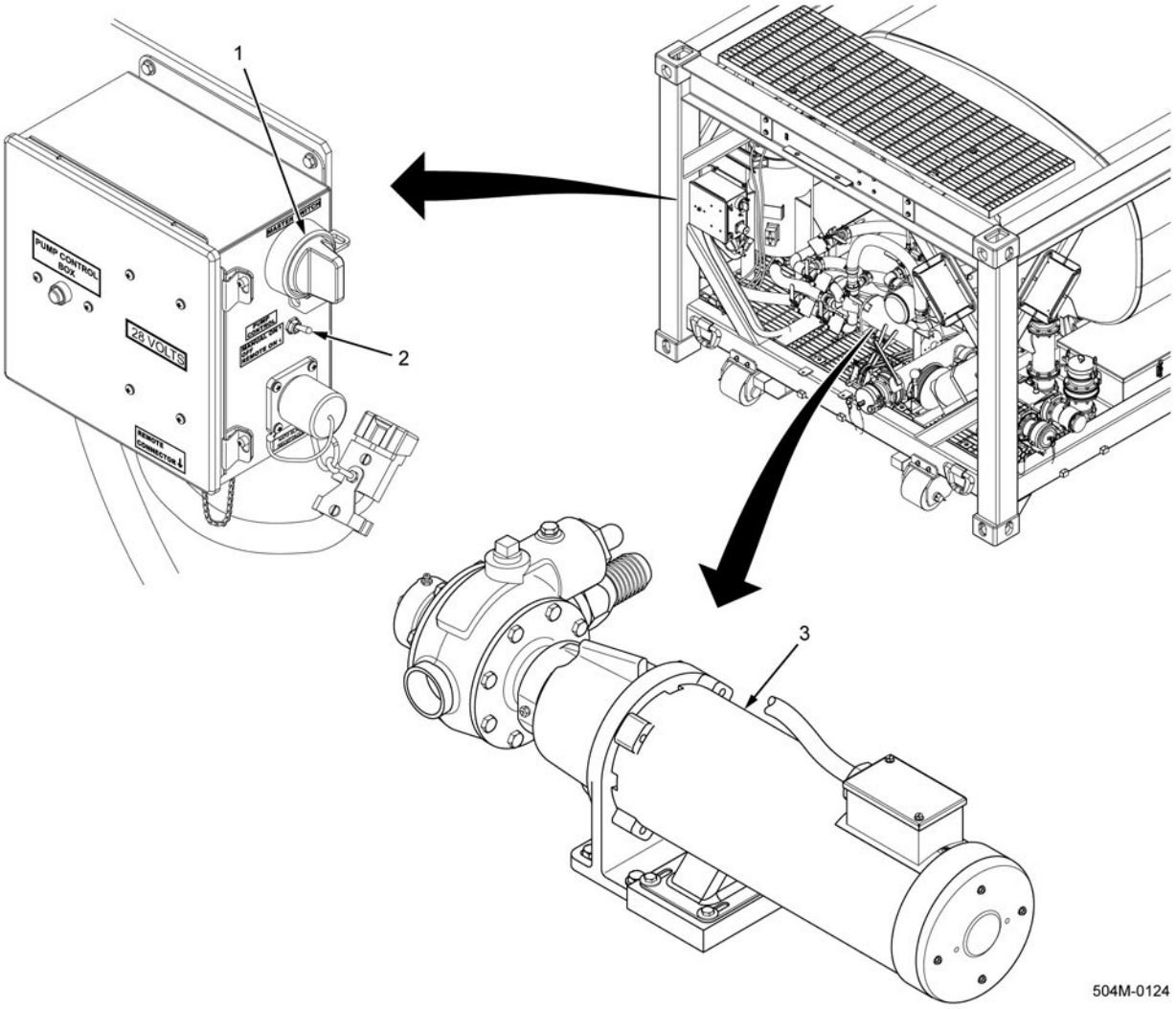


Figure 1. Checking Electric Motor and Pump Rotation.

2. Set pump control toggle switch (Figure 1, Item 2) to manual ON or, if using remote cable, set pump control toggle switch (Figure 1, Item 2) to remote ON, press remote cable switch and listen for any continuous sound from electric motor (Figure 1, Item 3).
3. Set pump control toggle switch (Figure 1, Item 2) to OFF.
4. Set master switch (Figure 1, Item 1) to OFF.

CONDITION/INDICATION

Did electric motor (Figure 1, Item 3) make any noise?

NO FLOW WHEN USING MANUAL OR REMOTE ON PUMP CONTROL TOGGLE SWITCH - Continued

DECISION

YES - Proceed to Malfunction: Electric motor or pump assembly faulty.
NO - Proceed to No Power At Electric Motor With Manual or Remote On Pump Control Toggle Switch Troubleshooting Procedures (WP 0008).

MALFUNCTION

Electric motor or pump assembly faulty

ACTION

1. Disconnect power from MFS TRM (TM 10-4930-371-10).
2. Remove one screw (Figure 2, Item 2) and remove coupling guard (Figure 2, Item 1).

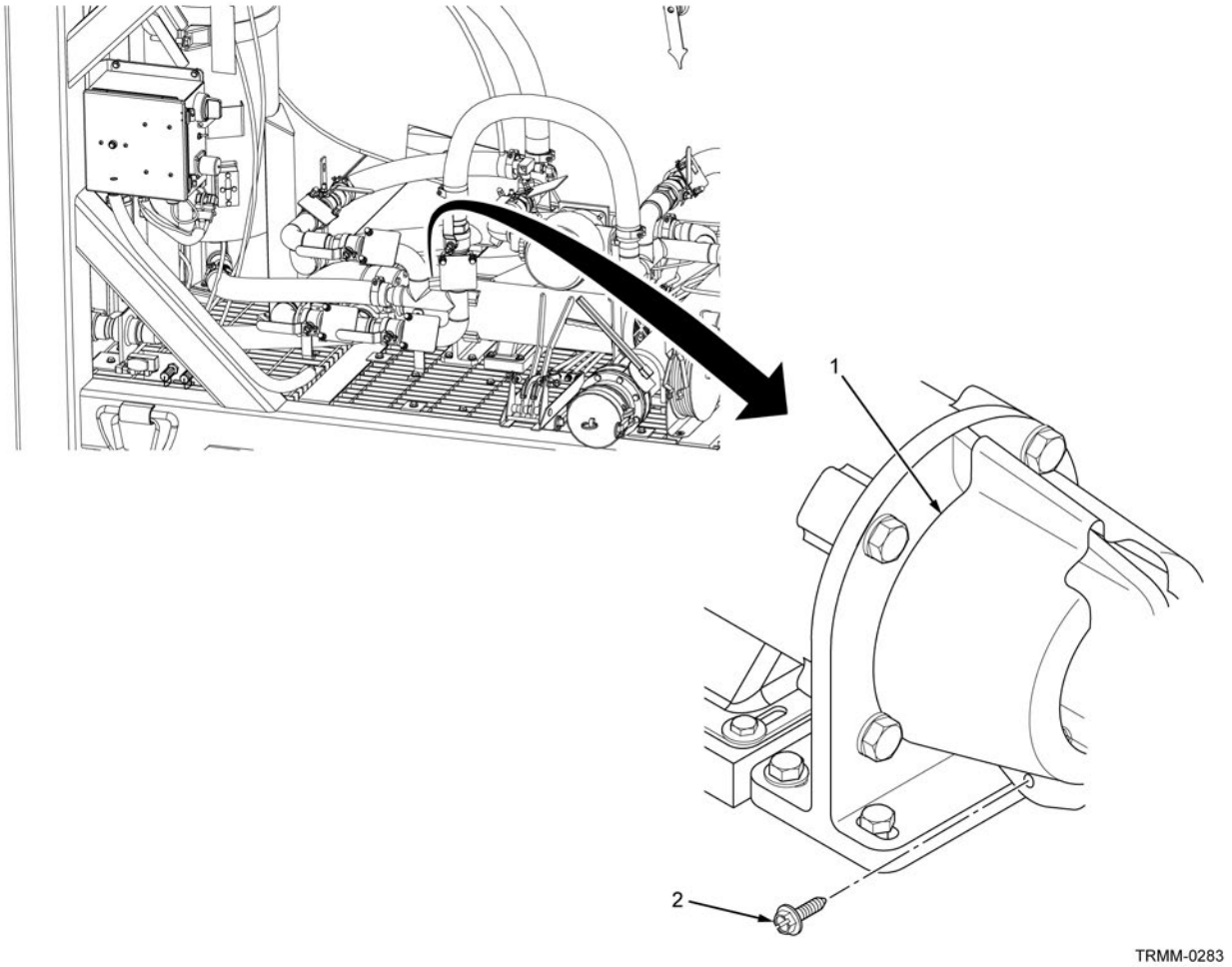


Figure 2. Remove Coupling Guard.

3. Separate lovejoy couplings (Figure 3, Items 2 and 3) by loosening setscrews (Figure 3, Items 5 and 7) and pulling apart lovejoy couplings (Figure 3, Items 2 and 3).

NO FLOW WHEN USING MANUAL OR REMOTE ON PUMP CONTROL TOGGLE SWITCH - Continued

4. Check if pump assembly (Figure 3, Item 8) or electric motor (Figure 3, Item 6) shaft can be rotated by hand:
   a. If pump assembly (Figure 3, Item 8) shaft (Figure 3, Item 1) does not rotate, replace pump assembly (WP 0080).
   b. If electric motor (Figure 3, Item 6) shaft (Figure 3, Item 4) does not rotate, replace electric motor assembly (WP 0079).
5. Verify condition is fixed by recirculating fuel (TM 10-4930-371-10).
6. Return MFS TRM to service if condition is fixed.

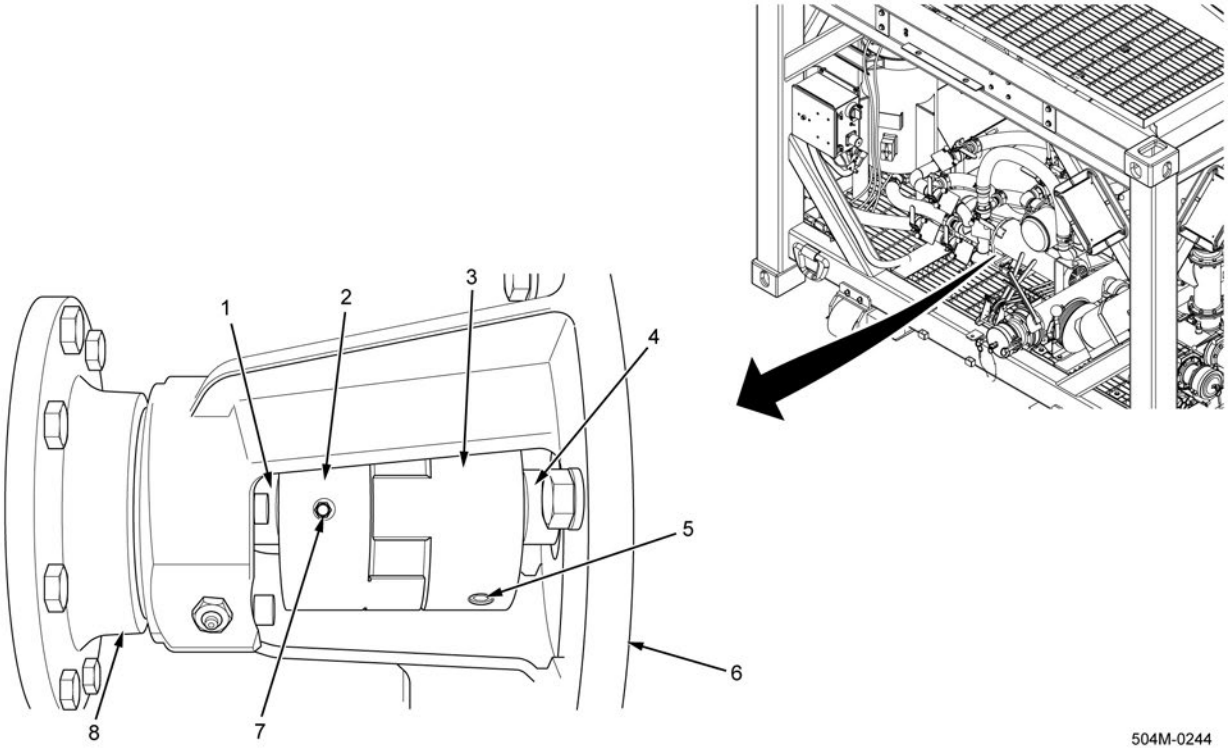


Figure 3. Separate Lovejoy Couplings.

END OF WORK PACKAGE

MAINTAINER TROUBLESHOOTING
AIR DOES NOT EXPEL BACK TO TANK BUT EXPELS THROUGH PIPING TO OUTLET OR SOME AIR IS EXPELLED TO TANK AND SOME AIR IS EXPELLED OUT THE NOZZLE TROUBLESHOOTING PROCEDURE

INITIAL SETUP:

Tools and Special Tools
Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
Fire extinguisher (TM 10-4930-371-10)
Gloves, disposible nitrile (WP 0216, Table 1, Item 5)
Goggles, industrial (WP 0216, Table 1, Item 6)

Personnel Required
91J Quartermaster and Chemical Equipment Repairer

References
ATP 4-43
TM 10-4930-371-10
WP 0144.2

Equipment Condition
TRM with ADR prepared for use (TM 10-4930-371-10)

Time to Complete
0.5 Hour(s)

GENERAL

This work package contains Maintainer troubleshooting procedures for TRM with ADR. Use this work package to help isolate and correct system problems. Ensure all operator PMCS and troubleshooting procedures have been performed.

TROUBLESHOOTING PROCEDURE

AIR DOES NOT EXPEL BACK TO TANK BUT EXPELS THROUGH PIPING TO OUTLET OR SOME AIR IS EXPELLED TO TANK AND SOME AIR IS EXPELLED OUT THE NOZZLE

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Failure to comply could result in injury or death to personnel.

AIR DOES NOT EXPEL BACK TO TANK BUT EXPELS THROUGH PIPING TO OUTLET OR SOME AIR IS EXPELLED TO TANK AND SOME AIR IS EXPELLED OUT THE NOZZLE - Continued

STEP

Attempt to perform fuel operations and monitor fuel nozzle for air (TM 10-4930-371-10).

CONDITION/INDICATION

Does air expel from fuel nozzle before full flow is established?

DECISION

YES - Proceed to Malfunction: Air elimination check valve (V18) faulty.
NO - Return TRM with ADR to service.

MALFUNCTION

Air elimination check valve (V18) faulty

ACTION

1. Replace air elimination check valve (V18) (WP 0144.2).
2. Verify condition is fixed by performing fuel operations (TM 10-4930-371-10).
3. Continue fueling operations if condition is fixed.

END OF WORK PACKAGE

MAINTAINER TROUBLESHOOTING
HOSE WILL NOT EVACUATE OR IS SLOW TO EVACUATE TROUBLESHOOTING PROCEDURE

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposible nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer

References
- ATP 4-43
- TM 10-4930-371-10
- WP 0144.7

Equipment Condition
- TRM with ADR prepared for use (TM 10-4930-371-10)

Time to Complete
- 0.5 Hour(s)

GENERAL

This work package contains Maintainer troubleshooting procedures for TRM with ADR. Use this work package to help isolate and correct system problems. Ensure all operator PMCS and troubleshooting procedures have been performed.

TROUBLESHOOTING PROCEDURE

HOSE WILL NOT EVACUATE OR IS SLOW TO EVACUATE

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Failure to comply could result in injury or death to personnel.

HOSE WILL NOT EVACUATE OR IS SLOW TO EVACUATE - Continued

STEP

Attempt to perform hose evacuation after fueling operations (TM 10-4930-371-10).

CONDITION/INDICATION

Does hose evacuate?

DECISION

YES - Return TRM with ADR to service.
NO - Proceed to Malfunction: Hose evacuation check valve (V20) faulty.

MALFUNCTION

Hose evacuation check valve (V20) faulty

ACTION

1. Replace hose evacuation check valve (V20) (WP 0144.7).
2. Verify condition is fixed by evacuating hose (TM 10-4930-371-10).
3. Continue fueling operations if condition is fixed.

END OF WORK PACKAGE

MAINTAINER TROUBLESHOOTING
AIR DOES NOT BLEED WHEN VACUUM BREAKER (VB1) OPENED TROUBLESHOOTING PROCEDURE

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposible nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer

References
- ATP 4-43
- TM 10-4930-371-10
- WP 0144.3

Equipment Condition
- TRM with ADR prepared for use (TM 10-4930-371-10)

Time to Complete
- 0.5 Hour(s)

GENERAL

This work package contains Maintainer troubleshooting procedures for TRM with ADR. Use this work package to help isolate and correct system problems. Ensure all operator PMCS and troubleshooting procedures have been performed.

TROUBLESHOOTING PROCEDURE

AIR DOES NOT BLEED WHEN VACUUM BREAKER (VB1) OPENED

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Failure to comply could result in injury or death to personnel.

AIR DOES NOT BLEED WHEN VACUUM BREAKER (VB1) OPENED - Continued

STEP

Open vacuum breaker (VB1) valve (Figure 1, Item 1).

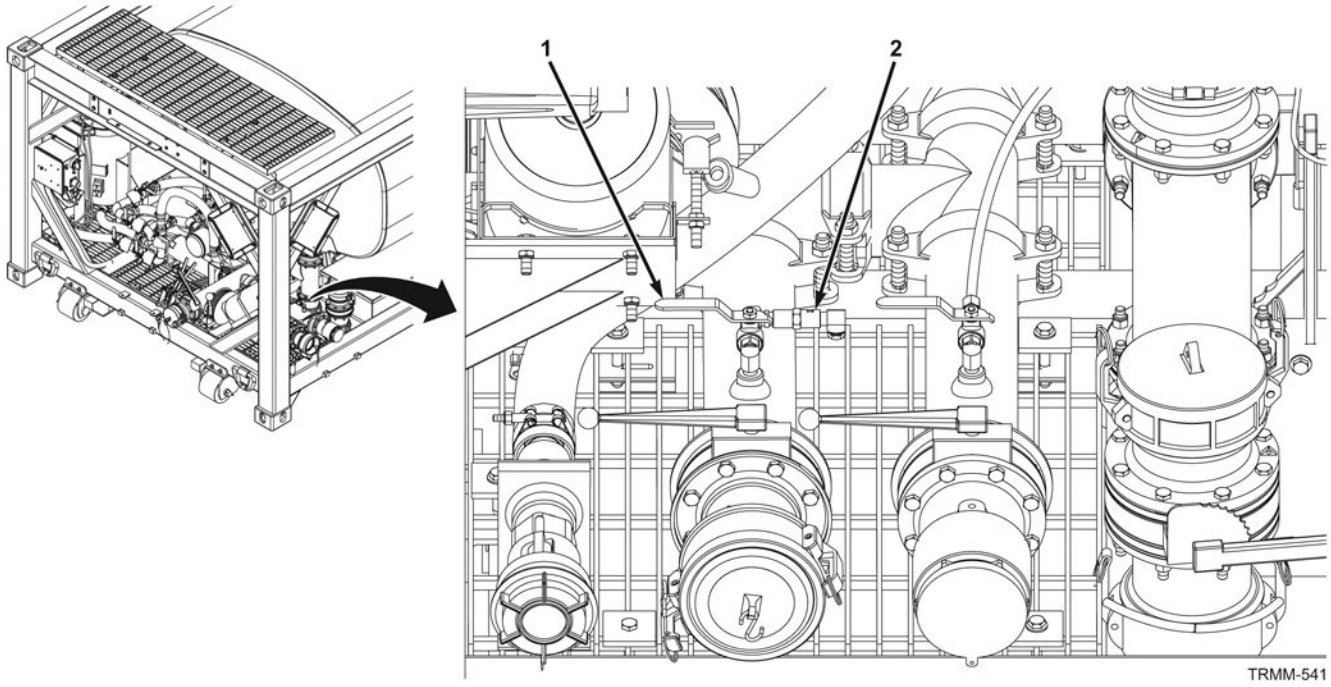


Figure 1. Vacuum Breaker (VB1) and (V23) Check Valve.

CONDITION/INDICATION

Does air bleed from vacuum breaker check valve (V23) (Figure 1, Item 2)?

DECISION

YES - Proceed to Malfunction: Vacuum breaker check valve (V23) faulty.
NO - Return TRM with ADR to service.

MALFUNCTION

Vacuum breaker check valve (V23) faulty

ACTION

1. Replace vacuum breaker check valve (V23) (Figure 1, Item 2) (WP 0144.3).
2. Verify condition is fixed by performing fuel operations (TM 10-4930-371-10).
3. Continue fueling operations if condition is fixed.

END OF WORK PACKAGE

MAINTAINER TROUBLESHOOTING
CIRCUIT BREAKER TRIPS AFTER BEING RESET TROUBLESHOOTING PROCEDURE

INITIAL SETUP:

Tools and Special Tools
Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
Fire extinguisher (TM 10-4930-371-10)
Multimeter, digital (WP 0217, Table 1, Item 6)

Personnel Required
91J Quartermaster and Chemical Equipment Repairer

References
TM 10-4930-371-10
Wiring Schematic

References (cont.)
WP 0079
WP 0110
WP 0112
WP 0116
WP 0119

Equipment Condition
MFS TRM prepared for use (TM 10-4930-371-10)

Time to Complete
2.0 Hour(s)

GENERAL

This work package contains Maintainer troubleshooting procedures for MFS TRM. Use this work package to help isolate and correct system problems. Ensure all operator PMCS and troubleshooting procedures have been performed.

TROUBLESHOOTING PROCEDURE

CIRCUIT BREAKER TRIPS AFTER BEING RESET

WARNING

The MFS TRM has 18-30 VDC voltage present at electrical connections. Electrical shock can cause injury or death to personnel. When replacing or servicing any electrical component, disconnect power cable. Failure to comply could result in injury or death to personnel.

STEP

1. Loosen two screws (Figure 1, Item 1) and open power control box cover (Figure 1, Item 2).

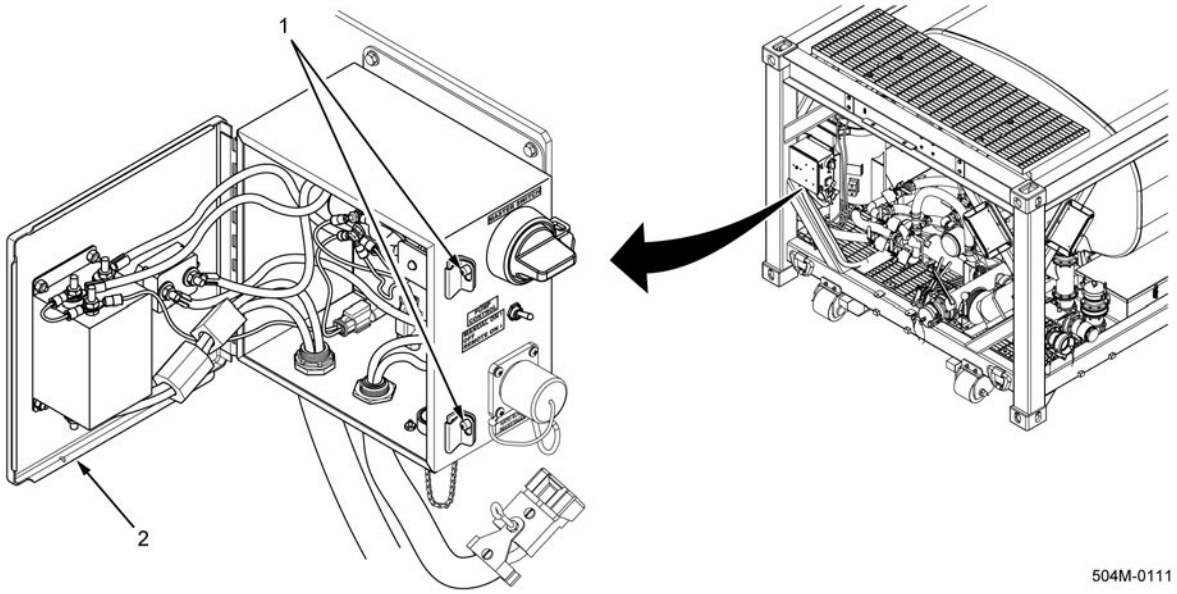


Figure 1. Opening Power Control Box Cover.

2. Verify test light LED (Figure 2, Item 1) is on.

CIRCUIT BREAKER TRIPS AFTER BEING RESET - Continued

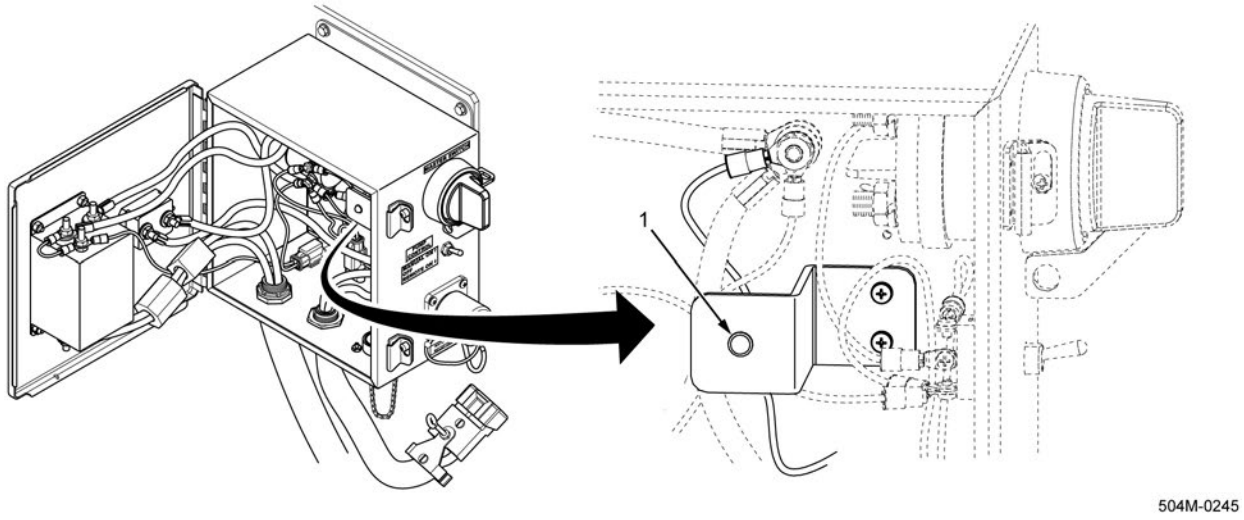


Figure 2. LED Test Light Location.

CONDITION/INDICATION

Is the test light LED (Figure 2, Item 1) on?

DECISION

YES - Proceed to Step 8.
NO - Ensure 24V power source is connected to MFS TRM (TM 10-4930-371-10).

STEP

NOTE

The master switch will remain in the OFF position for this check.

3. Close power control box cover (Figure 3, Item 1) and tighten two screws (Figure 3, Item 2).
4. Disconnect power source from MFS TRM.
5. Reset 70A circuit breaker (Figure 3, Item 3) on front of power control box.

CIRCUIT BREAKER TRIPS AFTER BEING RESET - Continued

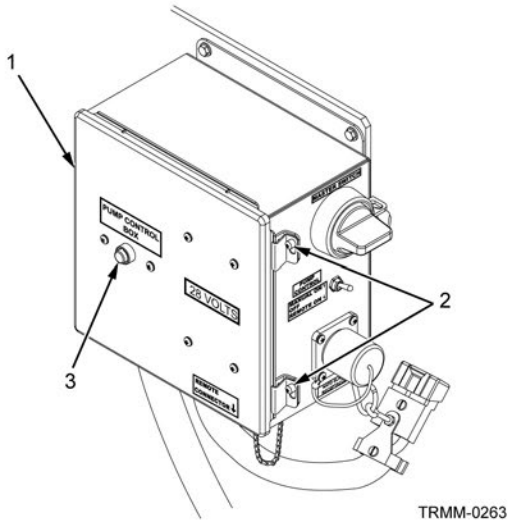


Figure 3. 70A Circuit Breaker.

6. Connect power source to MFS TRM, and start power source.
7. Check if 70A circuit breaker (Figure 3, Item 3) is tripped.

CONDITION/INDICATION

Is 70A circuit breaker (Figure 3, Item 3) tripped?

DECISION

YES - Proceed to Step 9.
NO - Return MFS TRM to service if condition is fixed.

STEP

8. Inspect all wires in the control box for insulation damage.

CONDITION/INDICATION

Does any wire have insulation damage?

DECISION

YES - Proceed to Malfunction: Damaged wire in power control box.
NO - Proceed to Step 3.

MALFUNCTION

Damaged wire in power control box

ACTION

1. Replace damaged wire (WP 0119).
2. Verify condition is fixed.
   a. Proceed to Step 3 if condition still exists.

CIRCUIT BREAKER TRIPS AFTER BEING RESET - Continued

b. Return MFS TRM to service if condition is fixed.

STEP

9. Shut down power source.
10. Disconnect power source from MFS TRM.
11. Loosen two screws (Figure 4, Item 1) and open power control box cover (Figure 4, Item 2).

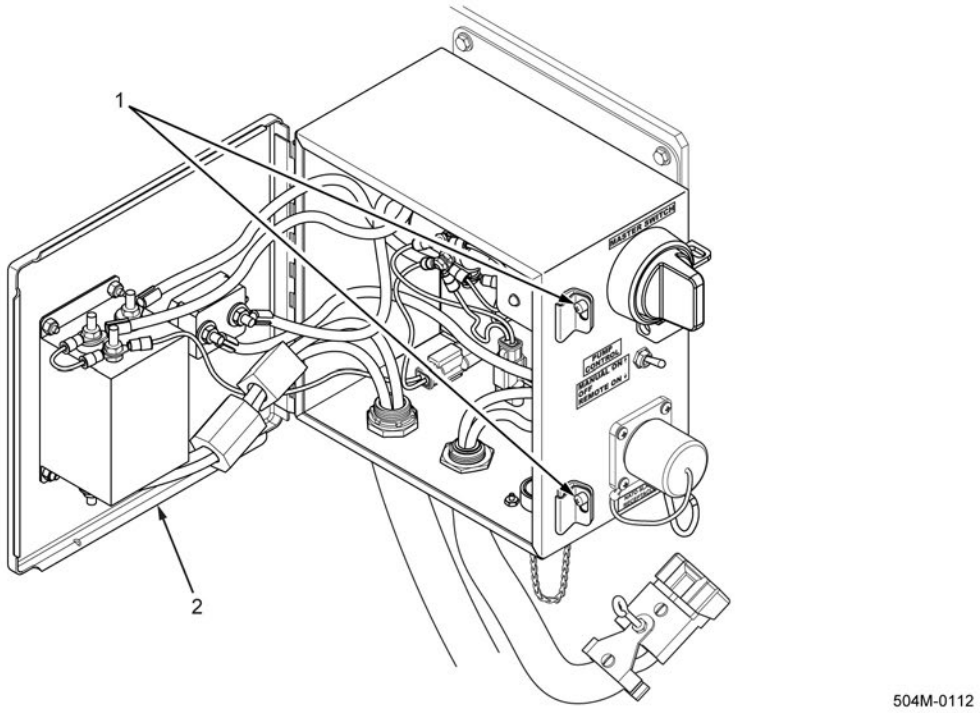


Figure 4. Opening Power Control Box Cover.

12. Disconnect both red wires (Figure 5, Items 1 and 2) from input lug (Figure 5, Item 3), nut (Figure 5, Item 4), and lock washer (Figure 5, Item 5) from relay (Figure 5, Item 6).
13. Check continuity between input lug (Figure 5, Item 3) of relay (Figure 5, Item 6) and ground lug (Figure 5, Item 7) on back panel of power control box.

CONDITION/INDICATION

Does continuity exist between input lug (Figure 5, Item 3) of relay (Figure 5, Item 6) and ground lug (Figure 5, Item 7)?

CIRCUIT BREAKER TRIPS AFTER BEING RESET - Continued

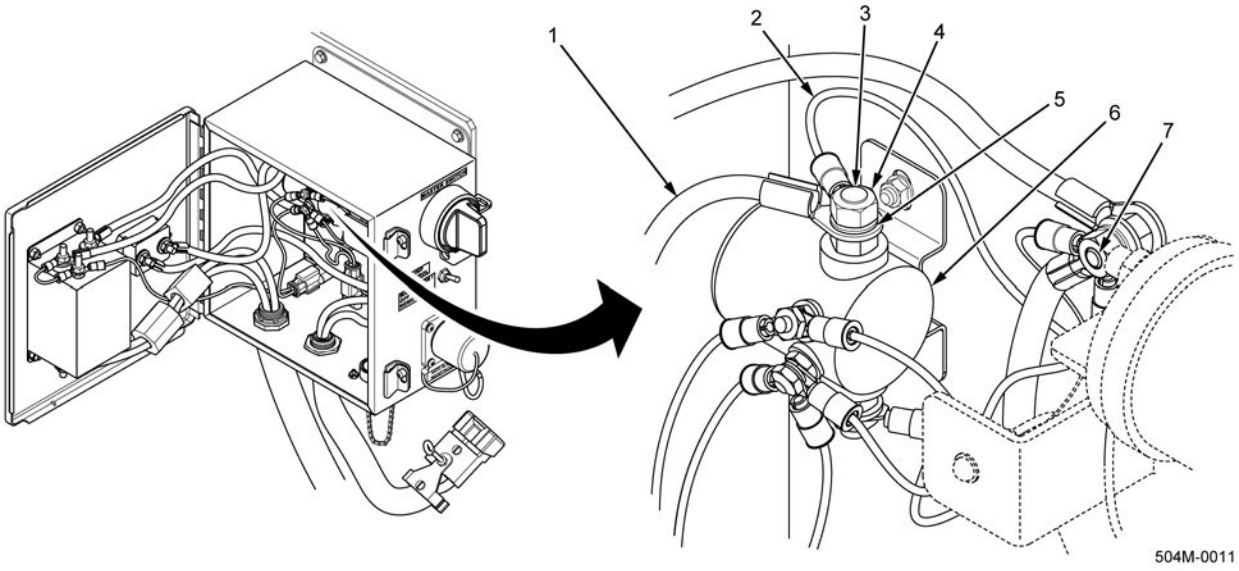


Figure 5. Relay Switch Side and Pump Control Toggle Switch Check.

DECISION

YES - Proceed to Malfunction: Relay faulty.
NO - Proceed to Malfunction: Circuit breaker faulty.

MALFUNCTION

Relay faulty

ACTION

1. Replace relay (WP 0116).
2. Verify condition is fixed.
3. Return MFS TRM to service if condition is fixed.

MALFUNCTION

Circuit breaker faulty

ACTION

1. Replace circuit breaker (WP 0110).
2. Verify condition is fixed.
   a. Proceed to Step 14 if condition still exists.
   b. Return MFS TRM to service if condition is fixed.

STEP

14. Loosen two screws (Figure 6, Item 1) and open power control box cover (Figure 6, Item 2).

CIRCUIT BREAKER TRIPS AFTER BEING RESET - Continued

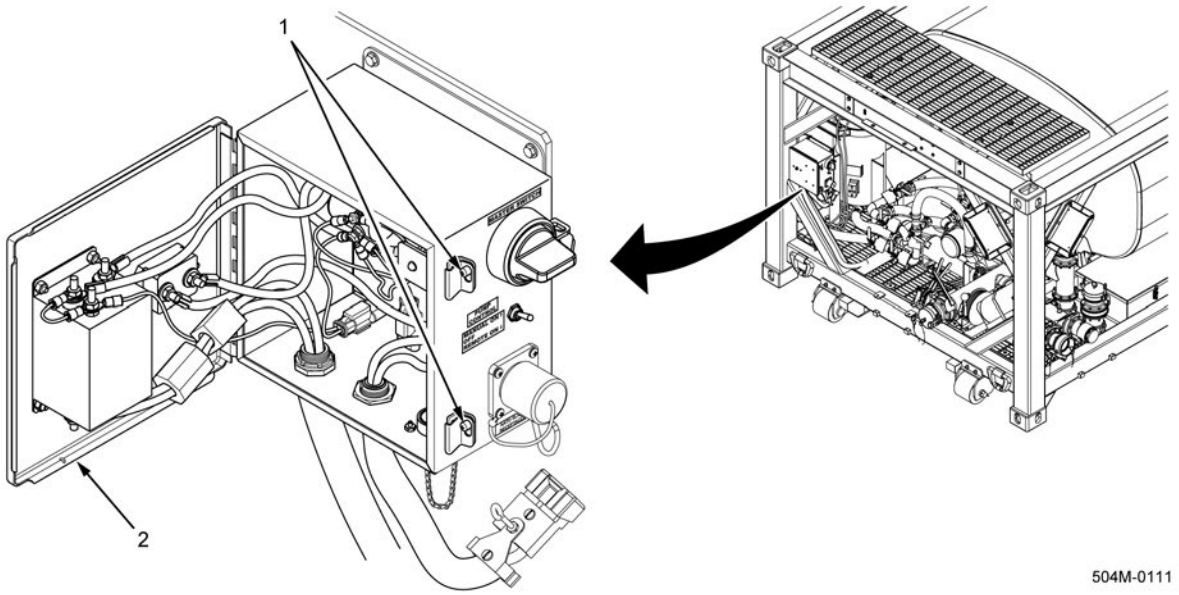


Figure 6. Opening Power Control Box Cover.

15. Disconnect power from MFS TRM.
16. Remove nut (Figure 7, Item 7), two flat washers (Figure 7, Item 8) and black L2 output wire (Figure 7, Item 9) from L2 output lug (Figure 7, Item 10) of EMI channel filter (Figure 7, Item 1).
17. Remove nut (Figure 7, Item 5), two flat washers (Figure 7, Item 4) and red L2 output wire (Figure 7, Item 6) from L1 output lug (Figure 7, Item 3) of EMI channel filter (Figure 7, Item 1).
18. Check continuity between L2 output lug (Figure 7, Item 10) and the L1 output lug (Figure 7, Item 3) of EMI channel filter (Figure 7, Item 1).

CIRCUIT BREAKER TRIPS AFTER BEING RESET - Continued

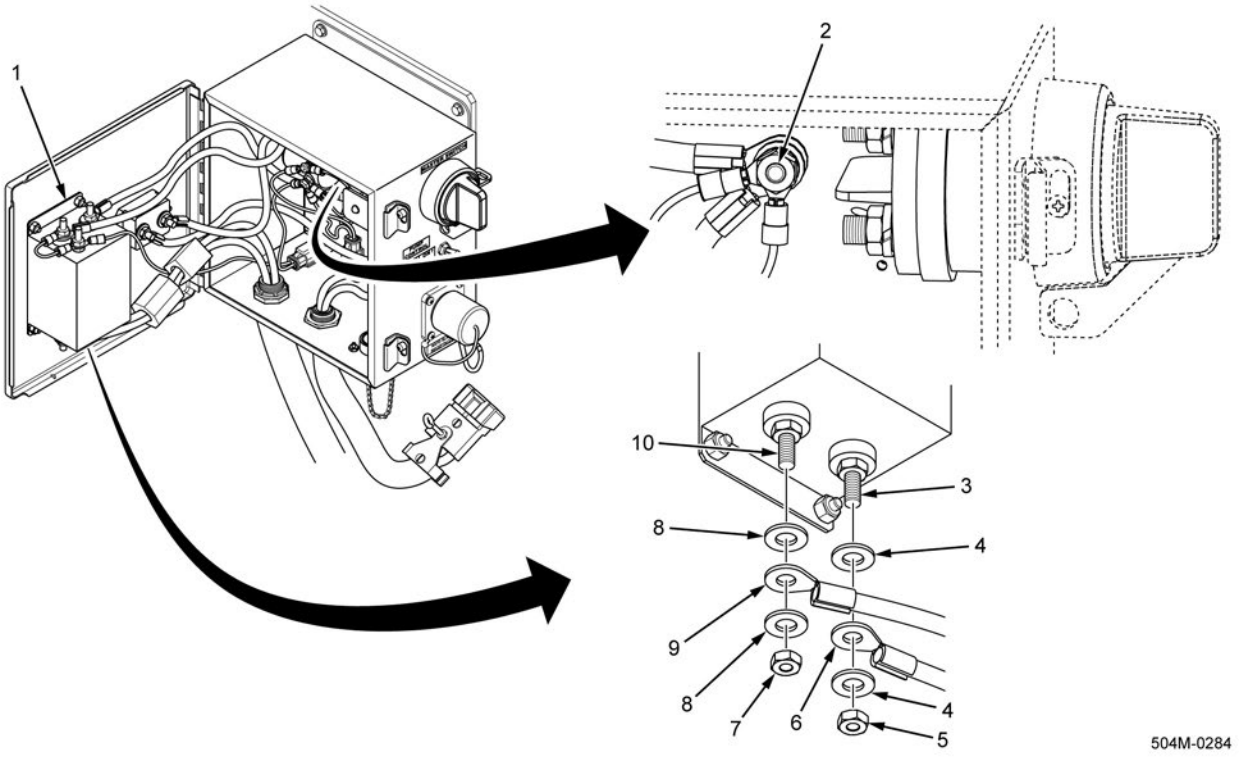


Figure 7. Continuity Check.

CONDITION/INDICATION

Does continuity exist between L2 output lug (Figure 7, Item 10) and L1 output lug (Figure 7, Item 3) of EMI channel filter (Figure 7, Item 1)?

DECISION

YES - Proceed to Malfunction: EMI channel filter faulty.
NO - Proceed to Step 19.

MALFUNCTION

EMI channel filter faulty

ACTION

1. Replace EMI channel filter (WP 0112).
2. Verify condition is fixed.
3. Return MFS TRM to service if condition is fixed.

STEP

19. Remove two screws (Figure 8, Item 1) from conduit box on electric motor and remove lid (Figure 8, Item 2).

CIRCUIT BREAKER TRIPS AFTER BEING RESET - Continued

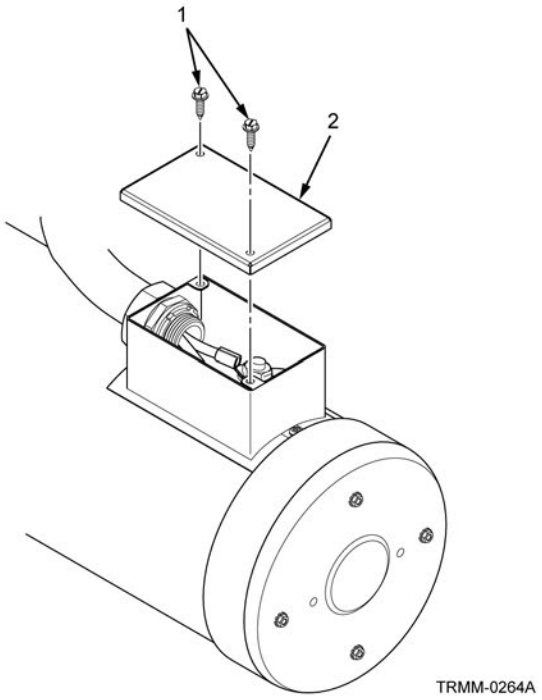


Figure 8. Remove Conduit Box Cover.

20. Remove nut (Figure 9, Item 1), flat washer (Figure 9, Item 8), and red power wire (Figure 9, Item 2) from stud (Figure 9, Item 7).
21. Remove nut (Figure 9, Item 4), flat washer (Figure 9, Item 5), and black wire (Figure 9, Item 3) from stud (Figure 9, Item 6).
22. Set digital multimeter to measure resistance (ohms).
23. Touch positive (red) probe to end of red L1 output wire (Figure 9, Item 9) and touch negative (black) probe to red power wire (Figure 9, Item 3).
24. Measure resistance.
25. Touch positive (red) probe to end of black L2 output wire (Figure 9, Item 10) and touch negative (black) probe to black power wire (Figure 9, Item 2).
26. Measure resistance.

CIRCUIT BREAKER TRIPS AFTER BEING RESET - Continued

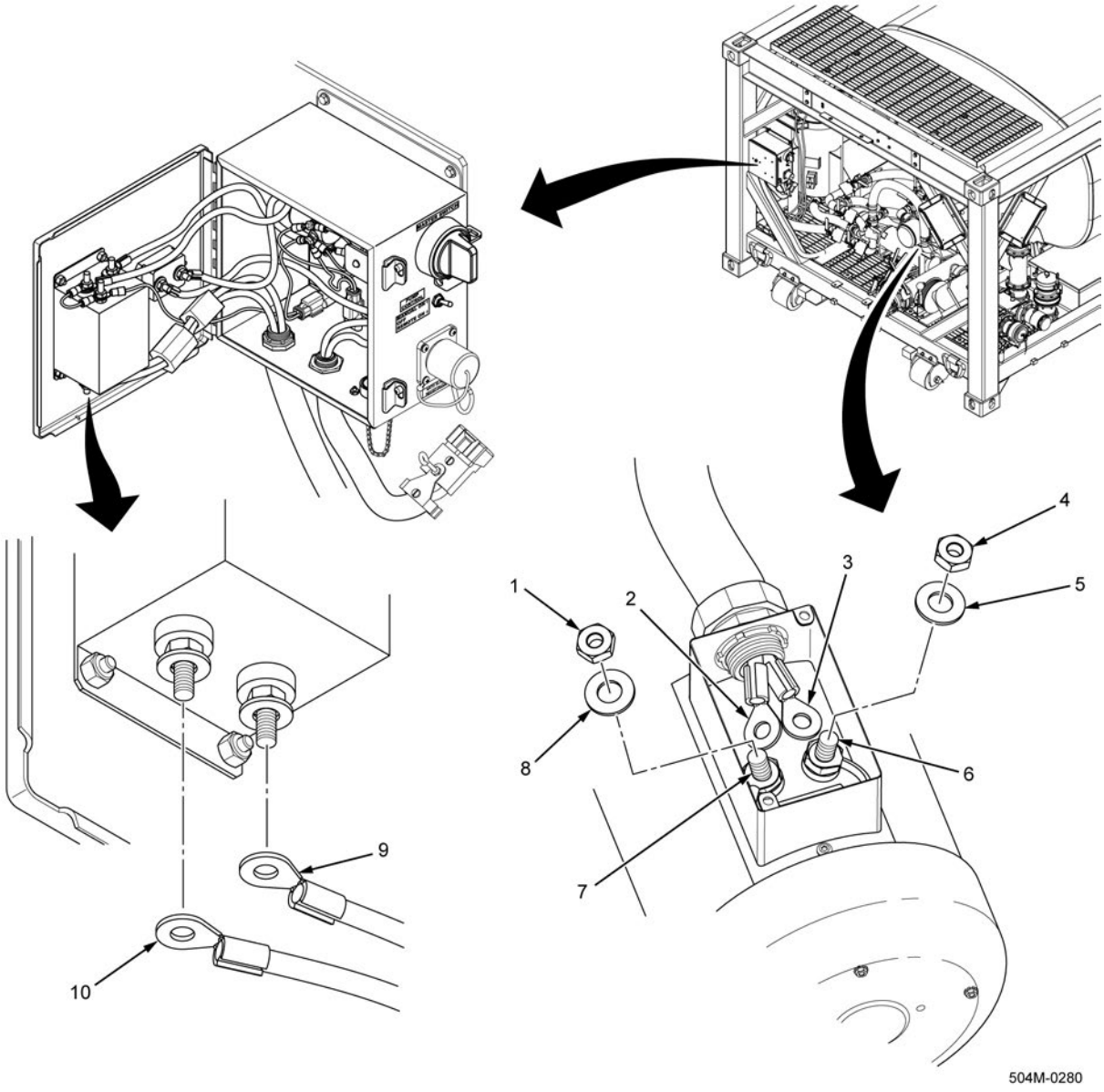


Figure 9. Electric Motor Power Cable Resistance Check.

CONDITION/INDICATION

Is resistance between 0 to 10 ohms in both wires?

DECISION

YES - Proceed with Step 27.
NO - Proceed to Malfunction: Electric motor power cable faulty.

CIRCUIT BREAKER TRIPS AFTER BEING RESET - Continued

MALFUNCTION

Electric motor power cable faulty

ACTION

1. Replace electric motor power cable (WP 0119).
2. Verify condition is fixed.
3. Return MFS TRM to service if condition is fixed.

STEP

27. Install black power wire (Figure 9, Item 2) to lug (Figure 9, Item 7) at electric motor with flat washer (Figure 9, Item 8) and nut (Figure 9, Item 1).
28. Install red power wire (Figure 9, Item 3) to lug (Figure 9, Item 6) at electric motor with flat washer (Figure 9, Item 5) and nut (Figure 9, Item 4).
29. Install electric motor cover (Figure 8, Item 2) and secure with two screws (Figure 8, Item 1).
30. Install red L1 output wire (Figure 10, Item 8) to L1 output lug (Figure 10, Item 9) of EMI channel filter (Figure 10, Item 1) with two flat washers (Figure 10, Item 7) and nut (Figure 10, Item 6).
31. Install black L2 output wire (Figure 10, Item 5) to L2 output lug (Figure 10, Item 2) of EMI channel filter (Figure 10, Item 1) with two flat washers (Figure 10, Item 3) and nut (Figure 10, Item 4).

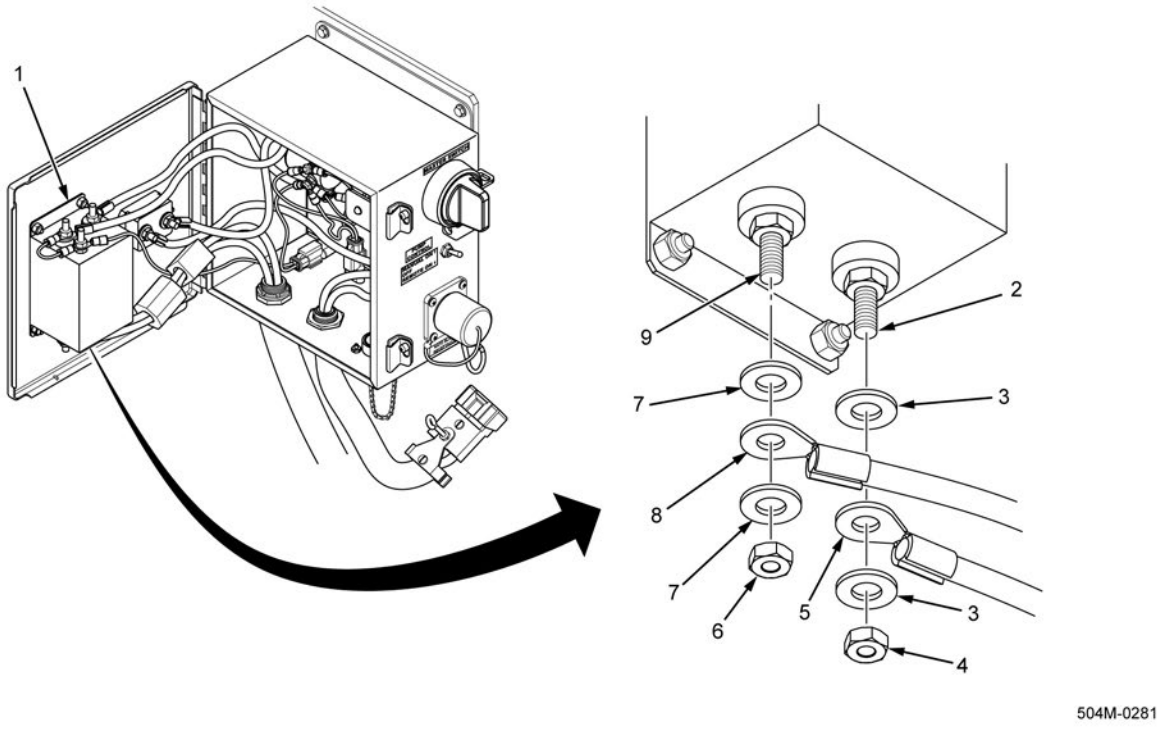


Figure 10. Install EMI Channel Filter Wires.

32. Close power control box cover (Figure 11, Item 1) and tighten two screws (Figure 11, Item 2).

CIRCUIT BREAKER TRIPS AFTER BEING RESET - Continued

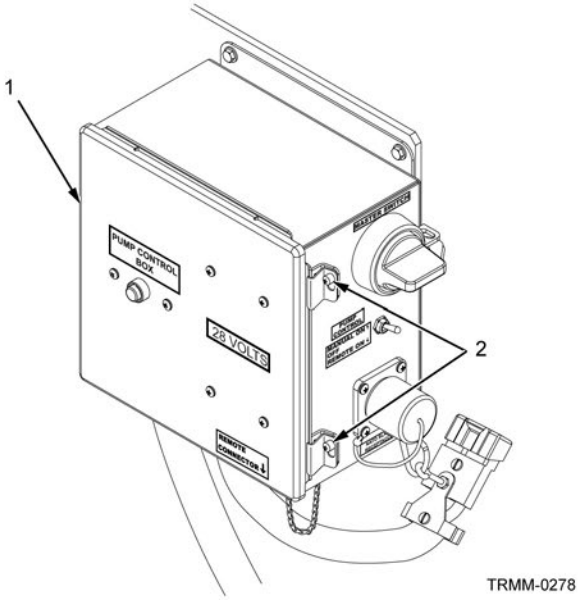


Figure 11. Close Power Control Box.

33. Reset 70A circuit breaker (Figure 12, Item 3).
34. Connect power source to MFS TRM, and start power source.
35. Set the master switch (Figure 12, Item 1) to ON.
36. Set the pump control toggle switch (Figure 12, Item 2) to ON .

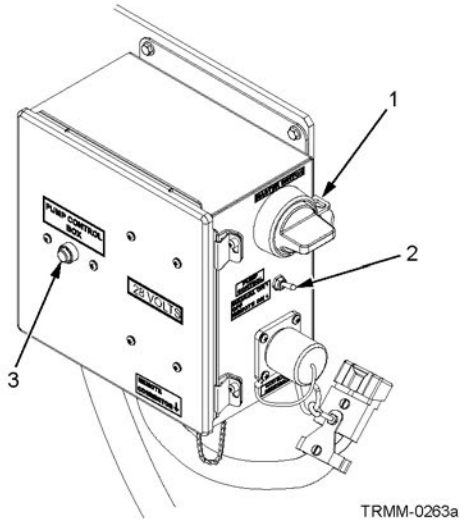


Figure 12. Reset 70A Circuit Breaker.

CIRCUIT BREAKER TRIPS AFTER BEING RESET - Continued

CONDITION/INDICATION

Is 70A circuit breaker tripped?

DECISION

YES - Proceed to Malfunction: Electric motor assembly faulty.
NO - Return MFS TRM to service if condition is fixed.

MALFUNCTION

Electric motor assembly faulty

ACTION

1. Replace electric motor assembly (WP 0079).
2. Verify condition is fixed.
3. Return MFS TRM to service if condition is fixed.

END OF WORK PACKAGE

MAINTAINER TROUBLESHOOTING
NO POWER AT ELECTRIC MOTOR WITH MANUAL OR REMOTE ON PUMP CONTROL TOGGLE SWITCH TROUBLESHOOTING PROCEDURE

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)
- Multimeter, digital (WP 0217, Table 1, Item 6)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer (2)

References
- TM 10-4930-371-10
- Wiring Schematic
- WP 0007
- WP 0110

References (cont.)
- WP 0112
- WP 0113
- WP 0114
- WP 0115
- WP 0116
- WP 0117
- WP 0118
- WP 0119

Equipment Condition
- MFS TRM prepared for use (TM 10-4930-371-10)

Time to Complete
- 1.0 Hour(s)

GENERAL

This work package contains Maintainer troubleshooting procedures for MFS TRM. Use this work package to help isolate and correct system problems. Ensure all operator PMCS and troubleshooting procedures have been performed.

TROUBLESHOOTING PROCEDURE

NO POWER AT ELECTRIC MOTOR WITH MANUAL OR REMOTE ON PUMP CONTROL TOGGLE SWITCH

WARNING

The MFS TRM has 18-30 VDC voltage present at electrical connections. Electrical shock can cause injury or death to personnel. When replacing or servicing any electrical component, disconnect power cable. Failure to comply could result in injury or death to personnel.

STEP

1. Check if 70A circuit breaker (Figure 1, Item 1) on front of control box is tripped.

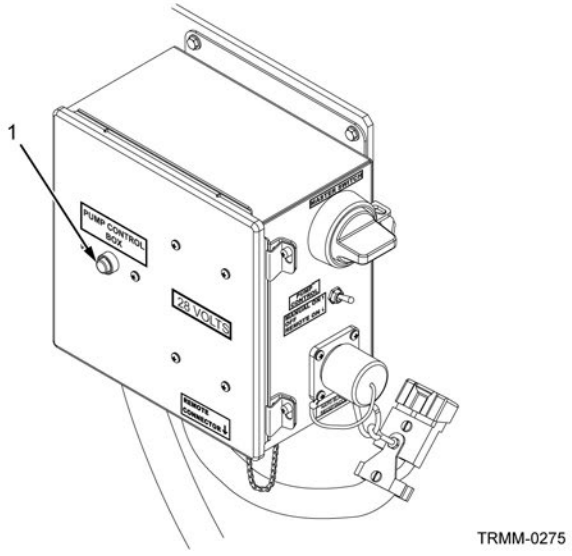


Figure 1. 70A Circuit Breaker.

CONDITION/INDICATION

Is 70A circuit breaker (Figure 1, Item 1) tripped?

DECISION

YES - Proceed to Step 2.
NO - Proceed to Step 3.

STEP

2. Reset 70A circuit breaker (Figure 1, Item 1).

CONDITION/INDICATION

Is 70A circuit breaker (Figure 1, Item 1) tripped again?

NO POWER AT ELECTRIC MOTOR WITH MANUAL OR REMOTE ON PUMP CONTROL TOGGLE SWITCH - Continued

DECISION

YES - Proceed to Circuit Breaker Trips After Being Reset Troubleshooting Procedure (WP 0007).
NO - Proceed to Step 3.

STEP

3. Loosen two screws (Figure 2, Item 2) and open power control box cover (Figure 2, Item 1).

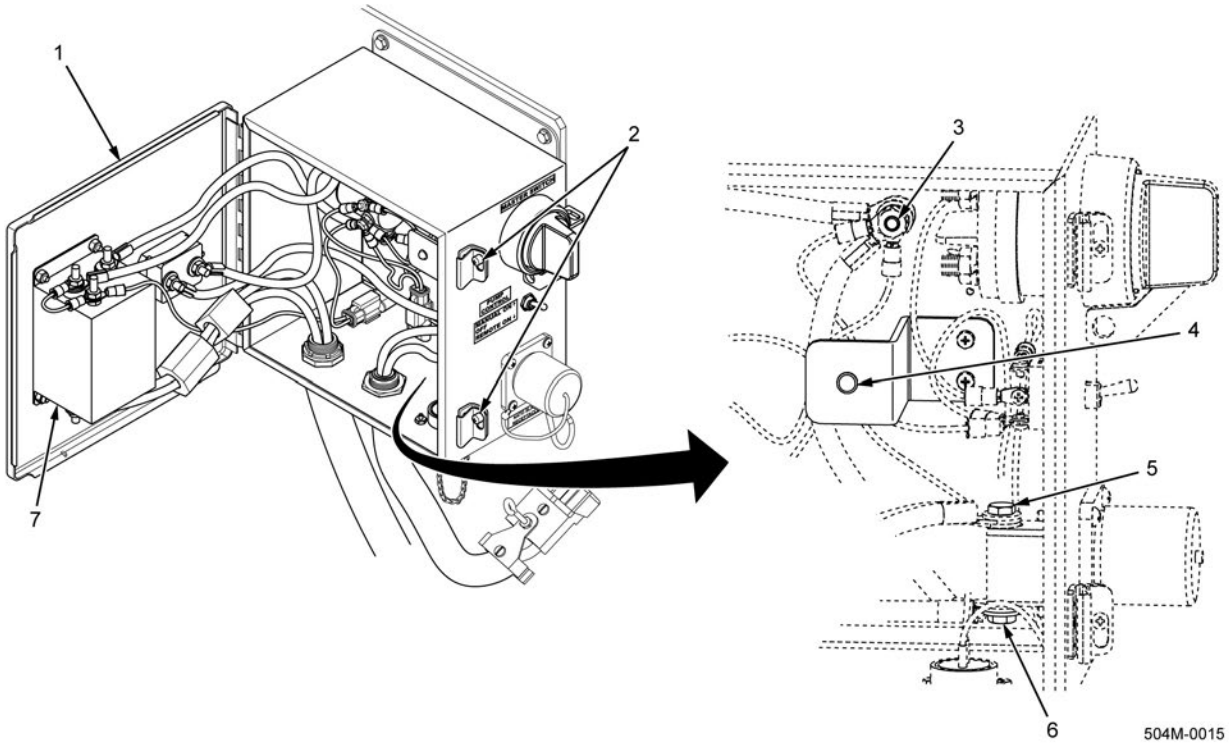


Figure 2. Input Power and Test Light LED Check.

4. Verify test light LED (Figure 2, Item 4) is ON.

CONDITION/INDICATION

Is the test light LED (Figure 2, Item 4) ON?

DECISION

YES - Proceed to Step 27.
NO - Proceed to Step 5.

STEP

5. Set digital multimeter to measure DC voltage.
6. Touch positive (red) probe to positive lug (Figure 2, Item 5) of NATO slave receptacle, and touch negative (black) probe to ground lug (Figure 2, Item 3) on back panel of power control box.

NO POWER AT ELECTRIC MOTOR WITH MANUAL OR REMOTE ON PUMP CONTROL TOGGLE SWITCH - Continued

7. Measure voltage.

CONDITION/INDICATION

Is voltage between 18 and 30 VDC?

DECISION

YES - Proceed to Malfunction: Test light LED faulty.
NO - Proceed to Step 8.

MALFUNCTION

Test light LED faulty

ACTION

NOTE

A faulty test light LED will not adversely affect pump operation and, therefore, replacement of the test light LED can be performed after the condition is fixed. If replacement of the test light LED is to be postponed, proceed to Step 27 and complete all troubleshooting steps prior to replacement.

1. Replace test light LED (WP 0118).
2. If condition still exists, proceed to Step 27.

STEP

8. Set digital multimeter to measure DC voltage.
9. Touch positive (red) probe to positive lug (Figure 2, Item 5) of NATO slave receptacle, and touch negative (black) probe to negative lug (Figure 2, Item 6) of NATO slave receptacle.

CONDITION/INDICATION

Is NATO slave receptacle output voltage between 18 and 30 VDC?

DECISION

YES - Proceed to Malfunction: NATO slave receptacle ground wire faulty.
NO - Proceed to Step 10.

MALFUNCTION

NATO slave receptacle ground wire faulty

ACTION

1. Replace NATO slave receptacle ground wire (WP 0119).
2. Verify condition is fixed by recirculating fuel (TM 10-4930-371-10).
3. Return MFS TRM to service if condition is fixed.

STEP

10. Shut down power source.

NO POWER AT ELECTRIC MOTOR WITH MANUAL OR REMOTE ON PUMP CONTROL TOGGLE SWITCH - Continued

11. Disconnect power source from MFS TRM.
12. Set digital multimeter to measure resistance (ohms).
13. Touch positive (red) probe to inner positive ring of NATO slave receptacle (Figure 3, Item 2), and touch negative (black) probe to positive lug of NATO slave receptacle (Figure 3, Item 4).
14. Measure resistance.
15. Touch positive (red) probe to outer housing of NATO slave receptacle (Figure 3, Item 1), and touch negative (black) probe to negative lug of NATO slave receptacle (Figure 3, Item 3).
16. Measure resistance.

CONDITION/INDICATION

Does continuity exist between both sets of terminals?

DECISION

YES - Proceed to Step 17.
NO - Proceed to Malfunction: NATO slave receptacle faulty.

MALFUNCTION

NATO slave receptacle faulty

ACTION

1. Replace NATO slave receptacle (WP 0114).
2. Verify condition is fixed by recirculating fuel (TM 10-4930-371-10).
3. Return MFS TRM to service if condition is fixed.

NO POWER AT ELECTRIC MOTOR WITH MANUAL OR REMOTE ON PUMP CONTROL TOGGLE SWITCH - Continued

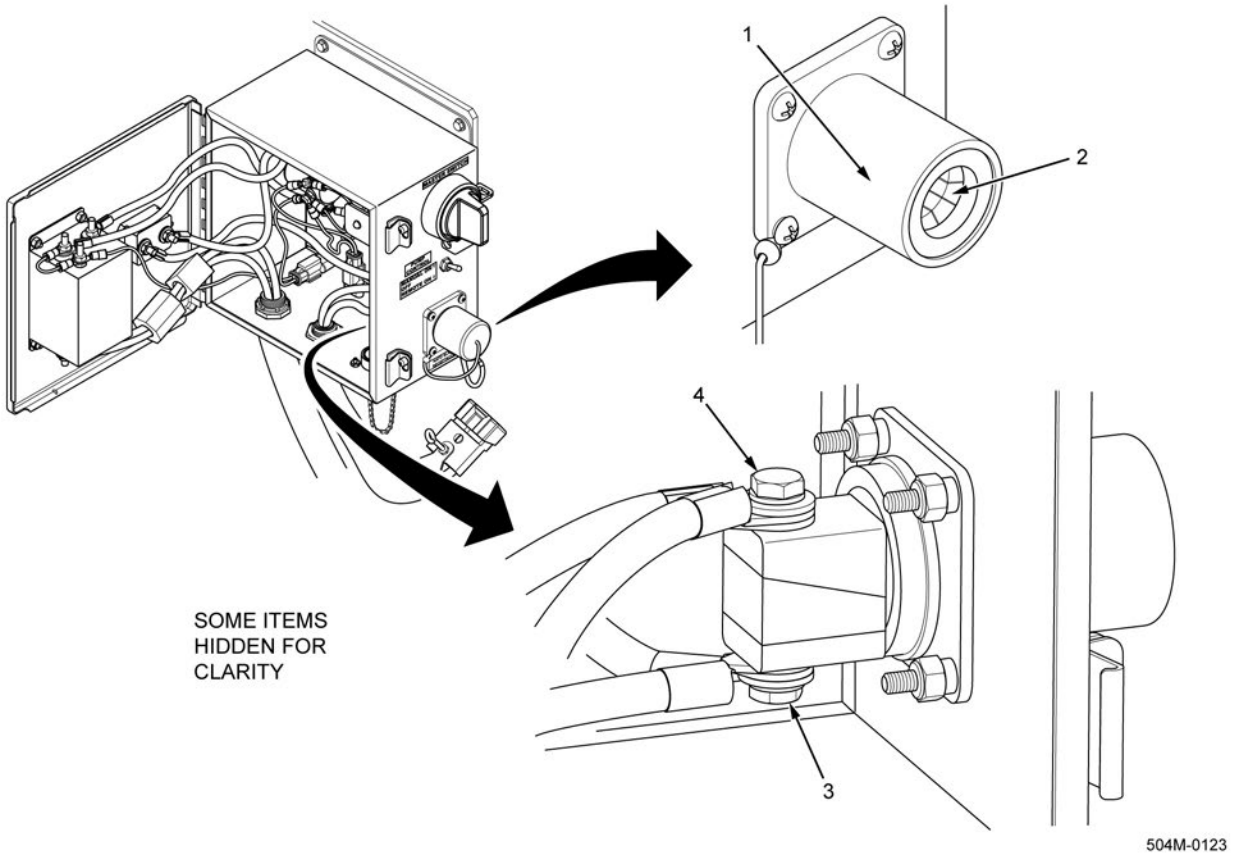


Figure 3. NATO Slave Receptacle Voltage Check.

STEP

17. Set digital multimeter to measure resistance (ohms).
18. Touch positive (red) probe to positive tab of NATO pigtail (Figure 4, Item 1), and touch negative (black) probe to positive lug of NATO slave receptacle (Figure 4, Item 4).
19. Measure resistance.
20. Touch positive (red) probe to negative tab of NATO pigtail (Figure 4, Item 2), and touch negative (black) probe to negative lug of NATO slave receptacle (Figure 4, Item 3).
21. Measure resistance.

CONDITION/INDICATION

Does continuity exist between both sets of terminals?

DECISION

YES - Proceed to Step 22.
NO - Proceed to Malfunction: NATO pigtail faulty.

NO POWER AT ELECTRIC MOTOR WITH MANUAL OR REMOTE ON PUMP CONTROL TOGGLE SWITCH - Continued

MALFUNCTION

NATO pigtail faulty

ACTION

1. Replace NATO pigtail (WP 0119).
2. Verify condition is fixed by recirculating fuel (TM 10-4930-371-10).
3. Return MFS TRM to service if condition is fixed.

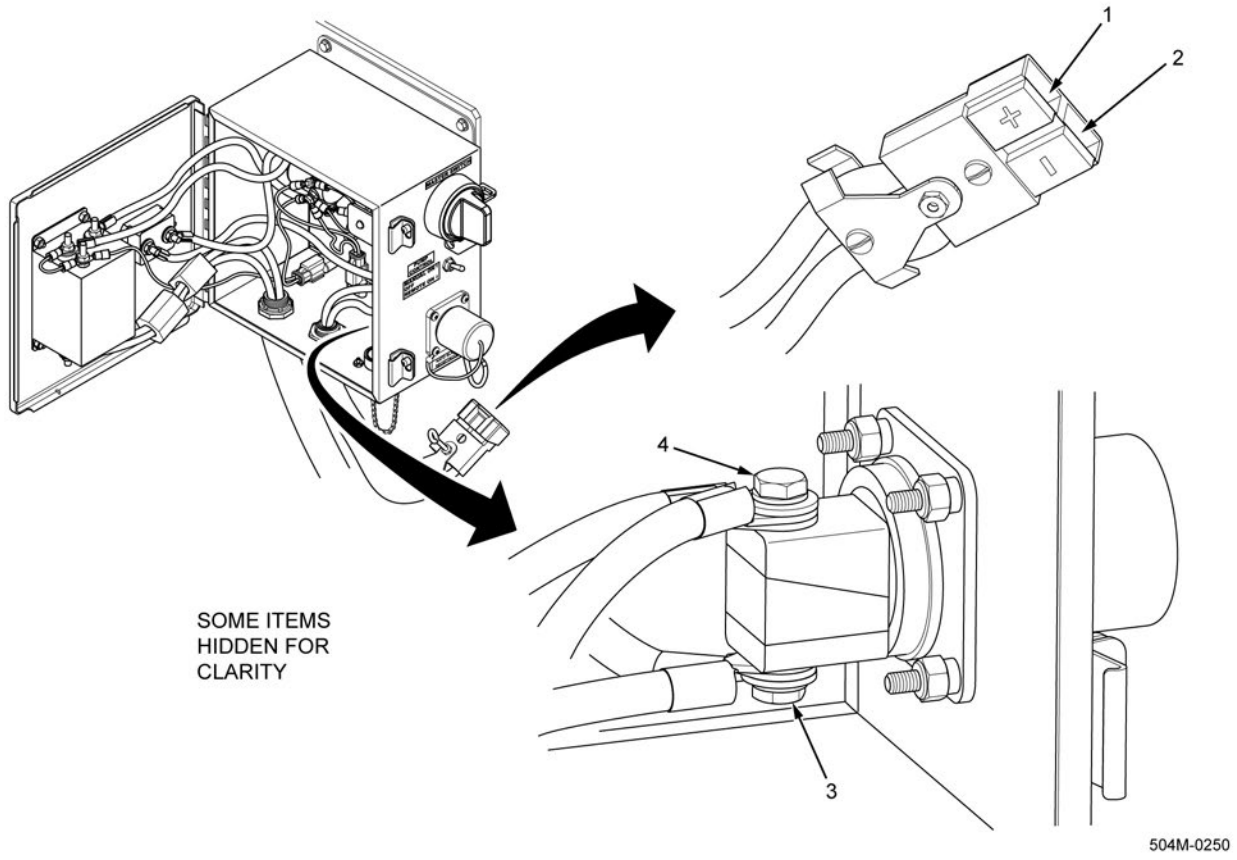


Figure 4. NATO Pigtail Resistance Test.

NO POWER AT ELECTRIC MOTOR WITH MANUAL OR REMOTE ON PUMP CONTROL TOGGLE SWITCH - Continued

STEP

22. Set digital multimeter to measure resistance (ohms).

NOTE

Steps 23 through 26 test the power source cable for the MFS TRM.

23. Touch positive (red) probe to positive lug on connector (Figure 5, item 3), and touch negative (black) probe to center post of NATO connector (Figure 5, item 1).

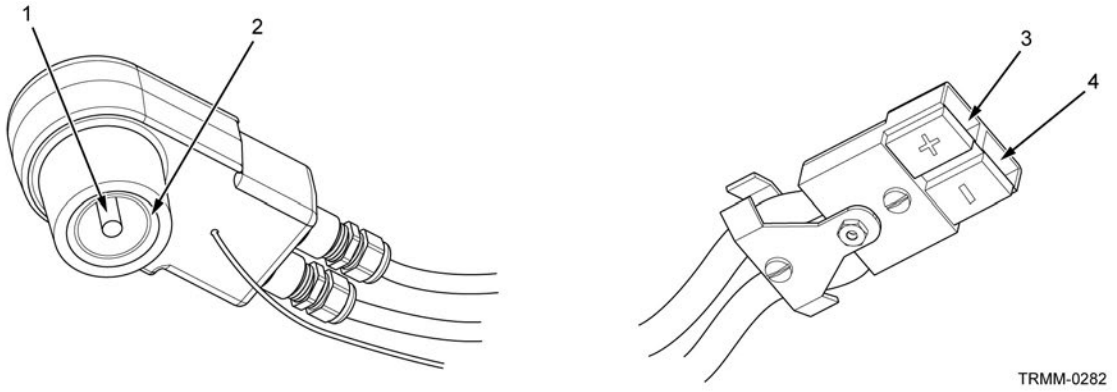


Figure 5. Power Cable Check.

24. Measure resistance.
25. Touch positive (red) probe to negative lug on connector (Figure 5, item 4), and touch negative (black) probe to outer ring of NATO connector (Figure 5, item 2).
26. Measure resistance.

CONDITION/INDICATION

Are both resistance measurements less than 10 ohms?

DECISION

YES - Troubleshoot power supply.
NO - Proceed to Malfunction: Power cable faulty.

MALFUNCTION

Power cable faulty

ACTION

1. Replace 40 ft. power cable (TM 10-4930-371-10).
2. Verify condition is fixed by recirculating fuel (TM 10-4930-371-10).
3. Return MFS TRM to service if condition is fixed.

NO POWER AT ELECTRIC MOTOR WITH MANUAL OR REMOTE ON PUMP CONTROL TOGGLE SWITCH - Continued

STEP

27. Set digital multimeter to measure DC voltage.
28. Set master switch (Figure 6, Item 1) to ON.

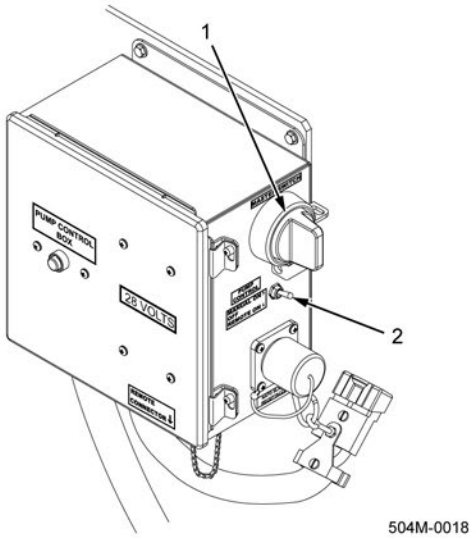


Figure 6. Master Switch and Pump Control Toggle Switch.

29. Set pump control toggle switch (Figure 6, Item 2) to manual ON.
30. Touch positive (red) probe to L1 output lug (Figure 7, Item 2) of EMI channel filter, and touch negative (black) probe to L2 output lug (Figure 7, Item 1) of EMI channel filter.

NO POWER AT ELECTRIC MOTOR WITH MANUAL OR REMOTE ON PUMP CONTROL TOGGLE SWITCH - Continued

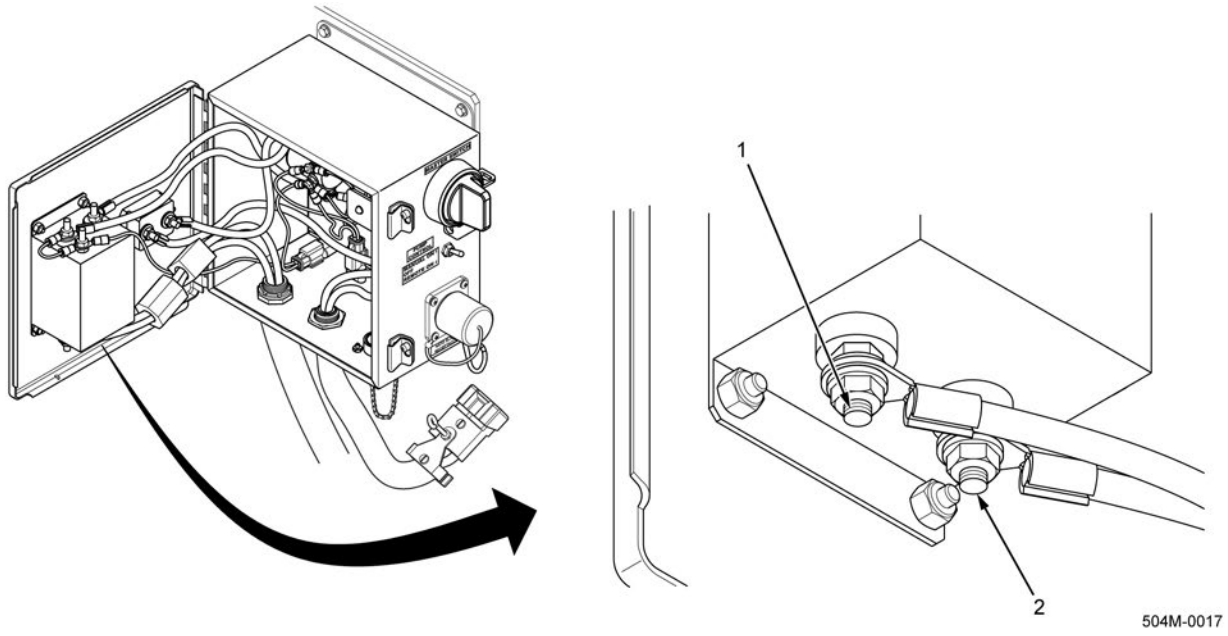


Figure 7. EMI Channel Filter Output Lugs.

31. Measure DC voltage.
32. Set pump control toggle switch (Figure 6, Item 2) to OFF.
33. Set master switch (Figure 6, Item 1) to OFF.

CONDITION/INDICATION

Is EMI channel filter output voltage between 18 and 30 VDC?

DECISION

YES - Proceed to Step 34.
NO - Proceed to Step 50.

STEP

WARNING

The MFS TRM has 18-30 VDC voltage present at electrical connections. Electrical shock can cause injury or death to personnel. When replacing or servicing any electrical component, disconnect power cable. Failure to comply could result in injury or death to personnel.

34. Disconnect power from MFS TRM.
35. Remove two screws (Figure 8, Item 1) from conduit box on electric motor and remove lid (Figure 8, Item 2).

NO POWER AT ELECTRIC MOTOR WITH MANUAL OR REMOTE ON PUMP CONTROL TOGGLE SWITCH - Continued

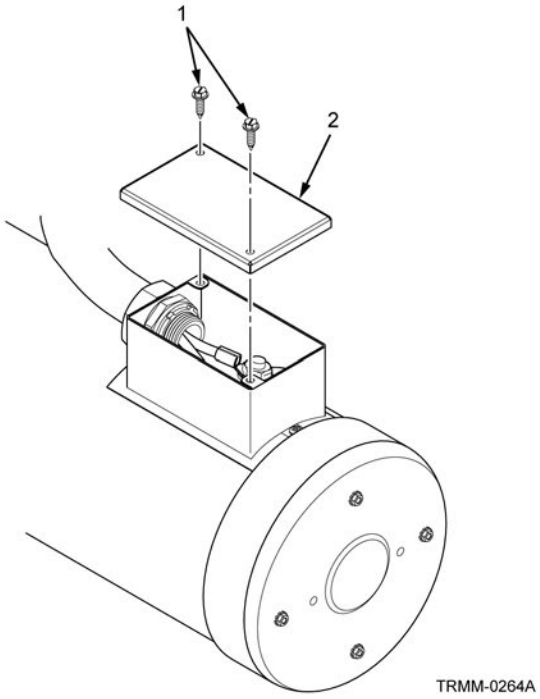


Figure 8. Remove Conduit Box Cover.

36. Remove nut (Figure 9, Item 4), flat washer (Figure 9, Item 5), and red power wire (Figure 9, Item 3) from stud.
37. Remove nut (Figure 9, Item 1), flat washer (Figure 9, Item 6), and black wire (Figure 9, Item 2) from stud.
38. Remove nut (Figure 9, Item 10), two flat washers (Figure 9, Item 11), and black L2 output (Figure 9, Item 12) wire from stud.
39. Remove nut (Figure 9, Item 8), two flat washers (Figure 9, Item 7), and red L1 output wire (Figure 9, Item 9) from stud.
40. Set digital multimeter to measure resistance (ohms).
41. Touch positive (red) probe to end of red L1 output wire (Figure 9, Item 9) and touch negative (black) probe to red power wire (Figure 9, Item 3).
42. Measure resistance.
43. Touch positive (red) probe to end of black L2 output wire (Figure 9, Item 12) and touch negative (black) probe to black power wire (Figure 9, Item 2).
44. Measure resistance.

NO POWER AT ELECTRIC MOTOR WITH MANUAL OR REMOTE ON PUMP CONTROL TOGGLE SWITCH - Continued

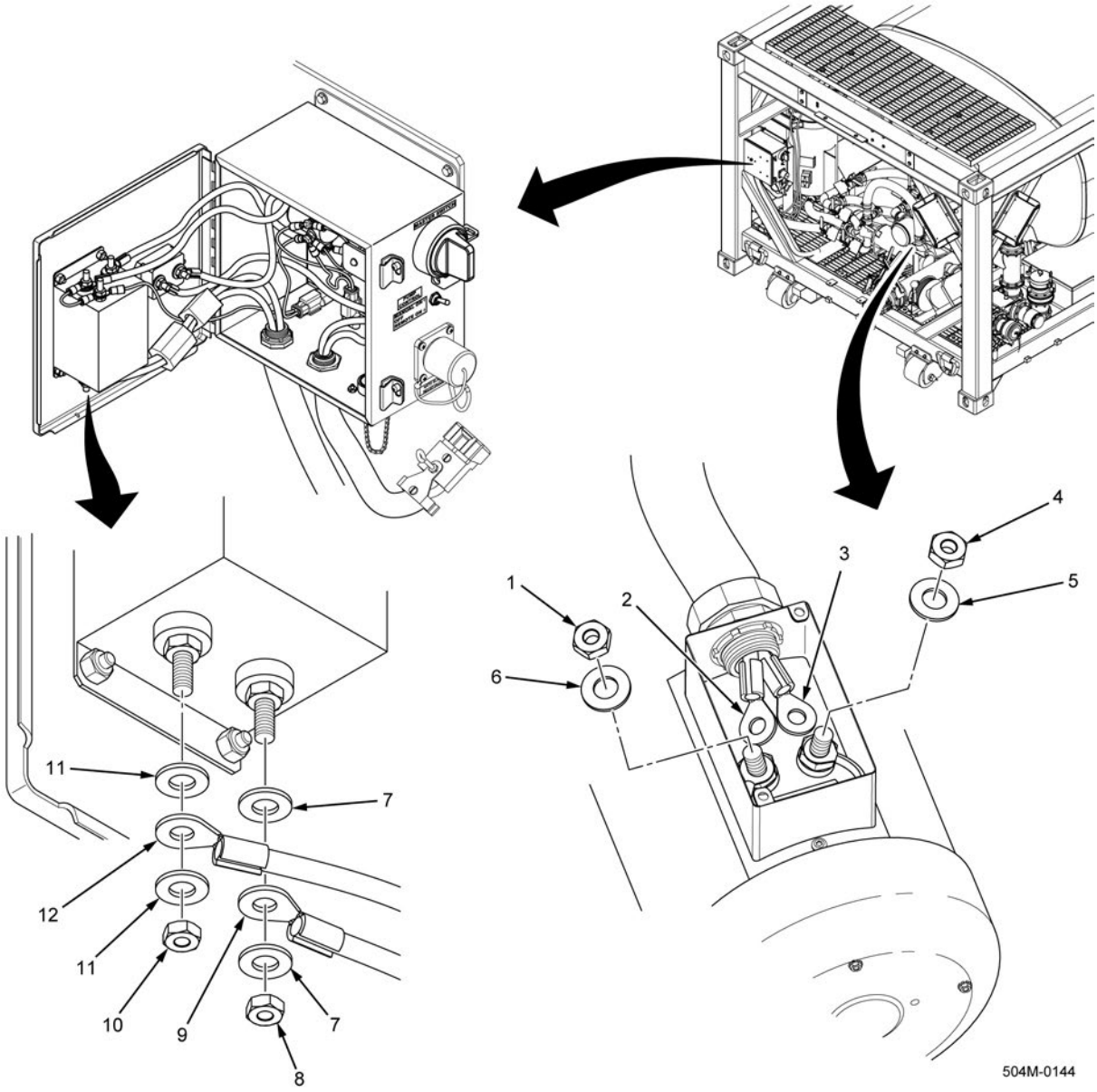


Figure 9. Electric Motor Power Cable Resistance Check.

45. Install black power wire (Figure 9, Item 2) to lug at electric motor with flat washer (Figure 9, Item 6) and nut (Figure 9, Item 1).
46. Install red power wire (Figure 9, Item 3) to lug at electric motor with flat washer (Figure 9, Item 5) and nut (Figure 9, Item 4).
47. Install electric motor cover (Figure 8, Item 2) and secure with two screws (Figure 8, Item 1).

NO POWER AT ELECTRIC MOTOR WITH MANUAL OR REMOTE ON PUMP CONTROL TOGGLE SWITCH - Continued

48. Install one flat washer (Figure 10, Item 4), red L1 output wire (Figure 10, Item 6) to L1 output lug (Figure 10, Item 3) of EMI channel filter (Figure 10, Item 1) and secure with one flat washer (Figure 10, Item 4) and nut (Figure 10, Item 5).
49. Install one flat washer (Figure 10, Item 8), black L2 output wire (Figure 10, Item 9) to L2 output lug (Figure 10, Item 10) of EMI channel filter (Figure 10, Item 1) and secure with one flat washer (Figure 10, Item 8) and nut (Figure 10, Item 7).

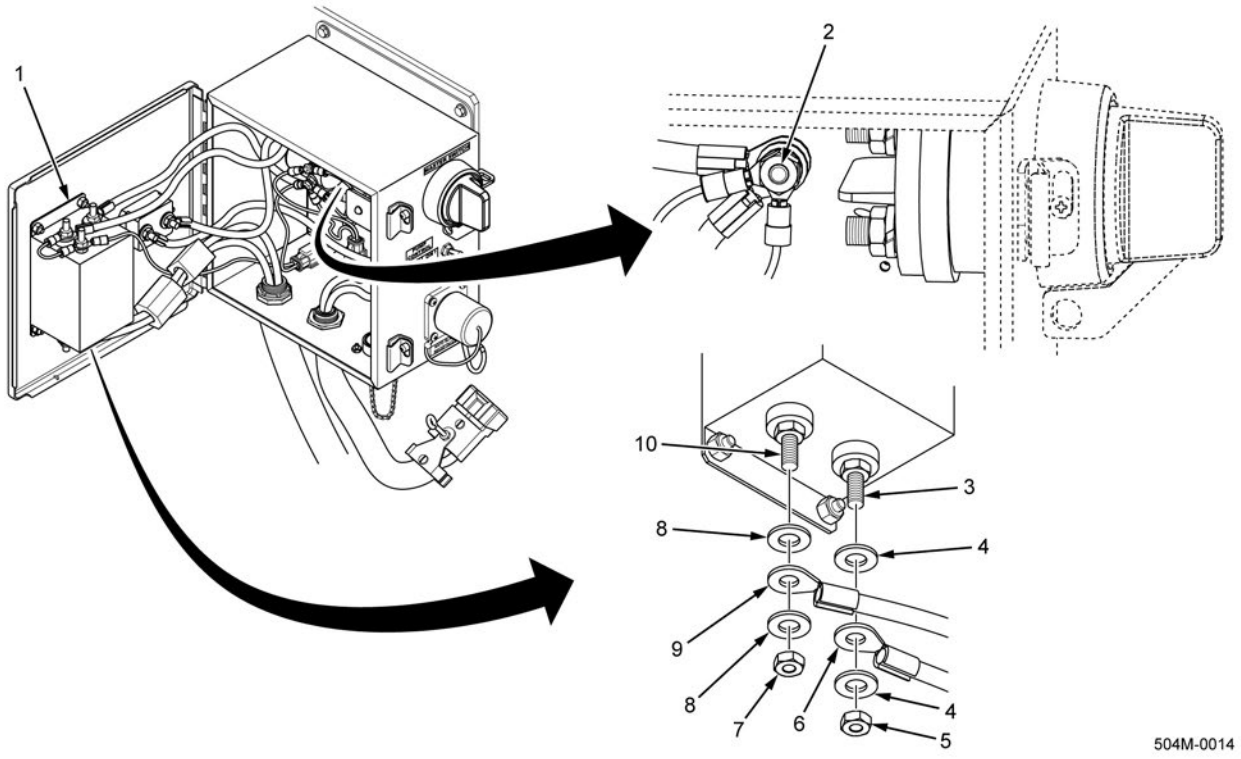


Figure 10. Reconnecting EMI Channel Filter.

CONDITION/INDICATION

Is resistance between 0 to 10 ohms in both wires?

DECISION

YES - Proceed to Step 53.
NO - Proceed to Malfunction: Electric motor power cable faulty.

MALFUNCTION

Electric motor power cable faulty

ACTION

1. Replace motor power cable (WP 0119).
2. Verify condition is fixed by recirculating fuel (TM 10-4930-371-10).

NO POWER AT ELECTRIC MOTOR WITH MANUAL OR REMOTE ON PUMP CONTROL TOGGLE SWITCH - Continued

3. Return MFS TRM to service if condition is fixed.

STEP

50. Set digital multimeter to measure DC voltage.
51. Touch positive (red) probe to circuit breaker lug (Figure 11, Item 2) and touch negative (black) probe to ground lug (Figure 11, Item 3).

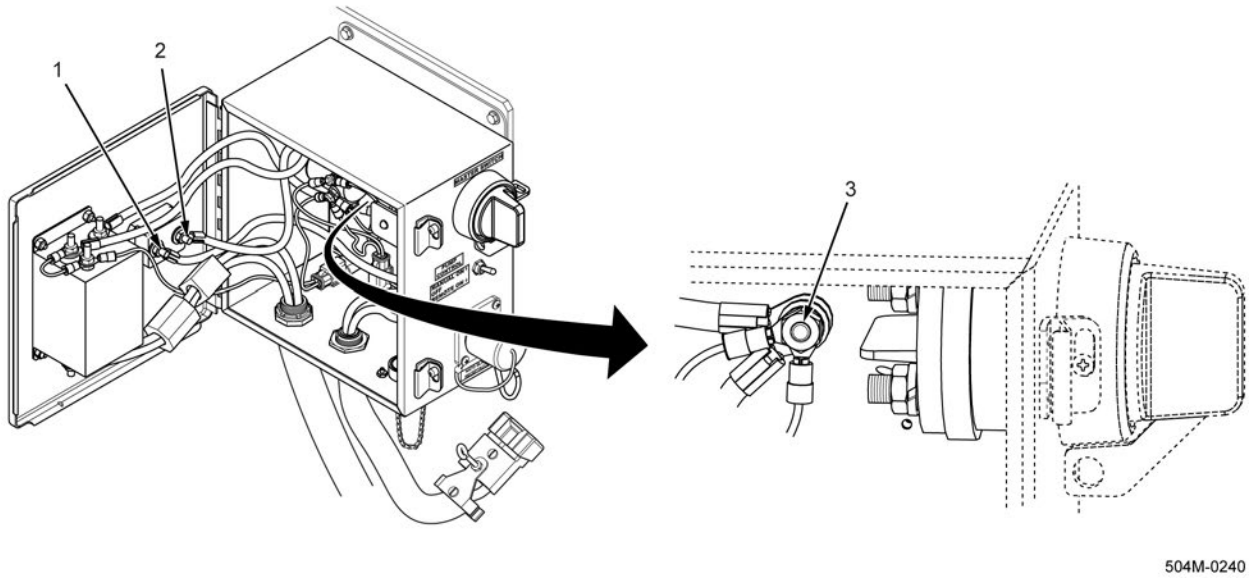


Figure 11. 70A Circuit Breaker and Input Circuit Check.

52. Measure DC voltage.

CONDITION/INDICATION

Is 70A circuit breaker (Figure 12, Item 1) input voltage between 18 and 30 VDC?

DECISION

YES - Proceed to Step 53.
NO - Proceed to Malfunction: 70A circuit breaker output wire faulty.

MALFUNCTION

70A circuit breaker output wire faulty

ACTION

1. Replace 70A circuit breaker output wire (WP 0119).
2. Verify condition is fixed by recirculating fuel (TM 10-4930-371-10).
3. Return MFS TRM to service if condition is fixed.

NO POWER AT ELECTRIC MOTOR WITH MANUAL OR REMOTE ON PUMP CONTROL TOGGLE SWITCH - Continued

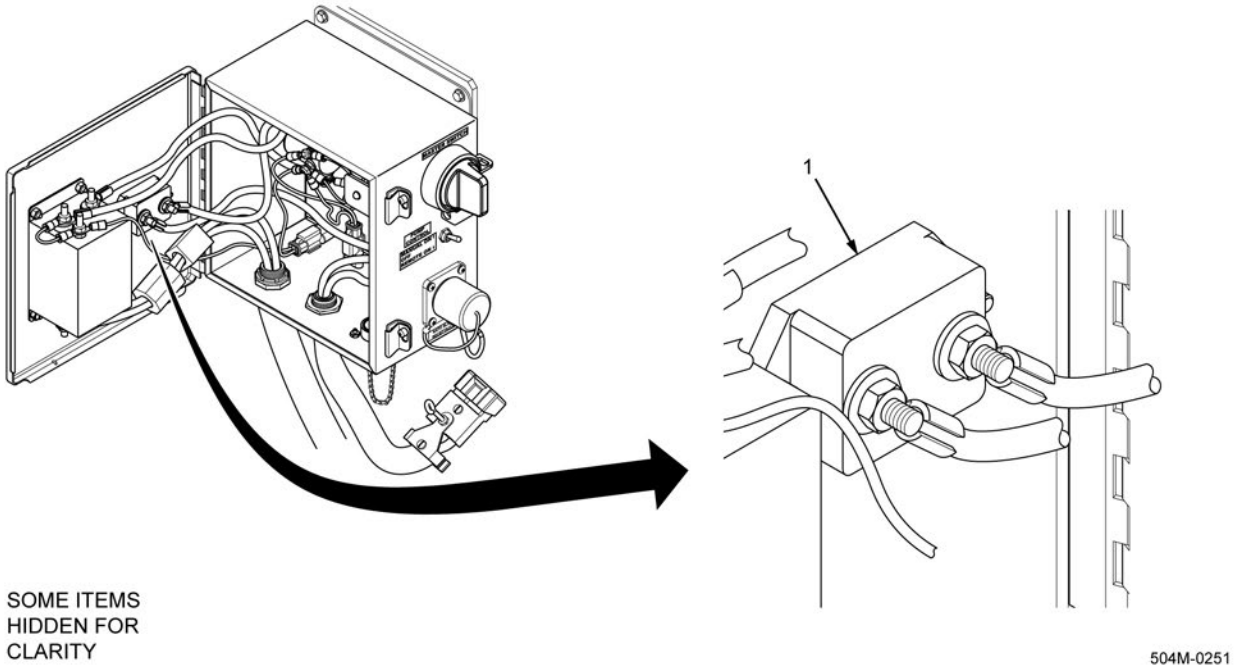


Figure 12. 70A Circuit Breaker.

STEP

53. If necessary, connect power to MFS TRM.
54. Set digital multimeter to measure DC voltage.
55. Touch positive (red) probe to circuit breaker lug (Figure 11, Item 1) and touch negative (black) probe to ground lug (Figure 11, Item 3).
56. Measure DC voltage.

CONDITION/INDICATION

Is 70A circuit breaker (Figure 12, Item 1) output voltage between 18 and 30 VDC?

DECISION

YES - Proceed to Step 57.
NO - Proceed to Malfunction: 70A circuit breaker faulty.

MALFUNCTION

70A circuit breaker faulty

ACTION

1. Replace 70A circuit breaker (WP 0110).
2. Verify condition is fixed by recirculating fuel (TM 10-4930-371-10).
3. Return MFS TRM to service if condition is fixed.

NO POWER AT ELECTRIC MOTOR WITH MANUAL OR REMOTE ON PUMP CONTROL TOGGLE SWITCH - Continued

STEP

57. Set digital multimeter to measure DC voltage.
58. Touch positive (red) probe to relay lug (Figure 13, Item 1) and touch negative (black) probe to ground lug (Figure 13, Item 2).

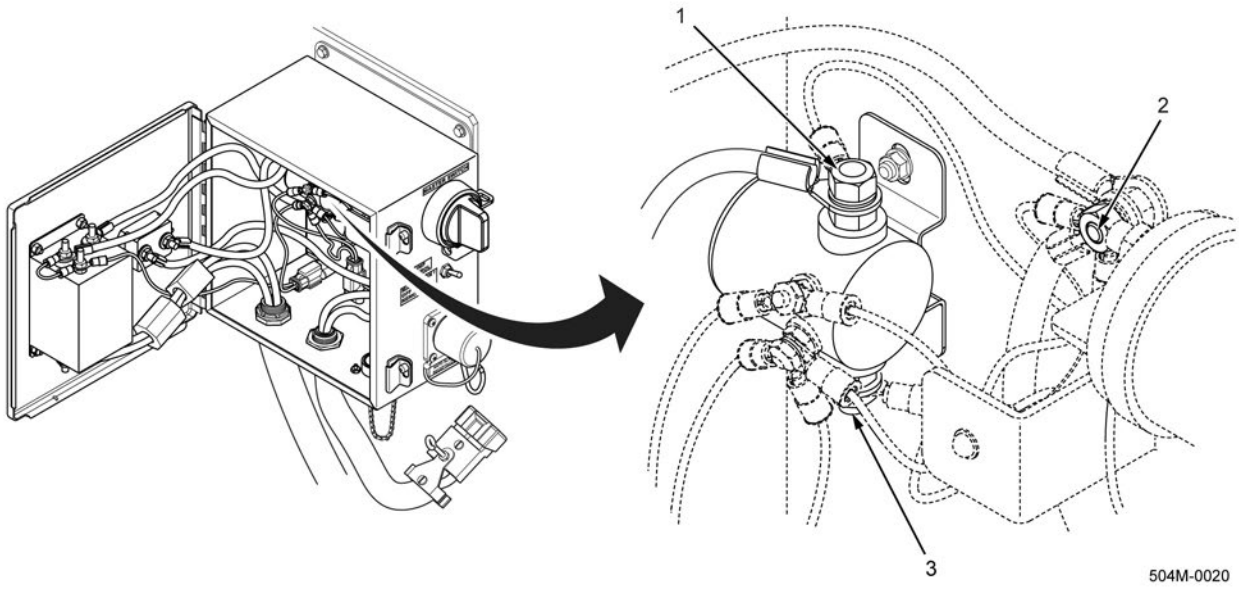


Figure 13. 70A Circuit Breaker and Relay Output Circuits Check.

59. Measure DC voltage.

CONDITION/INDICATION

Is output circuit voltage between 18 and 30 VDC?

DECISION

YES - Proceed to Step 60.
NO - Proceed to Malfunction: 70A circuit breaker output wire faulty.

MALFUNCTION

70A circuit breaker output wire faulty

ACTION

1. Replace 70A circuit breaker output wire (WP 0119).
2. Verify condition is fixed by recirculating fuel (TM 10-4930-371-10).
3. Return MFS TRM to service if condition is fixed.

STEP

60. Set digital multimeter to measure DC voltage.

NO POWER AT ELECTRIC MOTOR WITH MANUAL OR REMOTE ON PUMP CONTROL TOGGLE SWITCH - Continued

61. Set master switch (Figure 14, Item 1) to ON.
62. Set pump control toggle switch (Figure 14, Item 2) to ON.

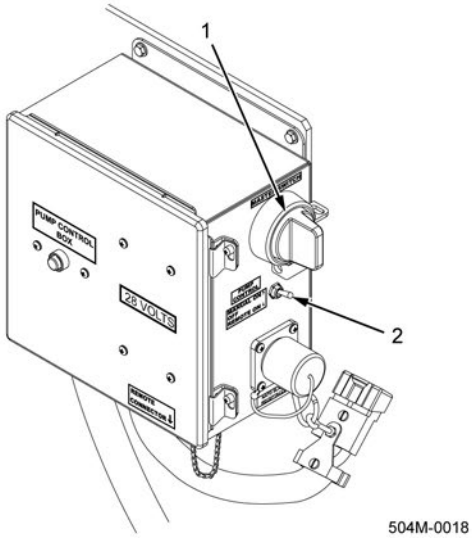


Figure 14. Switch Location.

63. Touch positive (red) probe to relay lug (Figure 13, Item 3) and touch negative (black) probe to ground lug (Figure 13, Item 2).
64. Measure DC voltage.
65. Set pump control toggle switch (Figure 14, Item 2) to OFF.
66. Set master switch (Figure 14, Item 1) to OFF.

CONDITION/INDICATION

Is relay switch side output voltage between 18 and 30 VDC?

DECISION

YES - Proceed to Step 67.
NO - Proceed to Step 81.

STEP

67. Set digital multimeter to measure DC voltage.
68. Set master switch (Figure 14, Item 1) to ON.
69. Set pump control toggle switch (Figure 14, Item 2) to ON.
70. Touch positive (red) probe to EMI channel filter L1 input lug (Figure 15, Item 2), and touch negative (black) probe to ground lug (Figure 15, Item 3).

NO POWER AT ELECTRIC MOTOR WITH MANUAL OR REMOTE ON PUMP CONTROL TOGGLE SWITCH - Continued

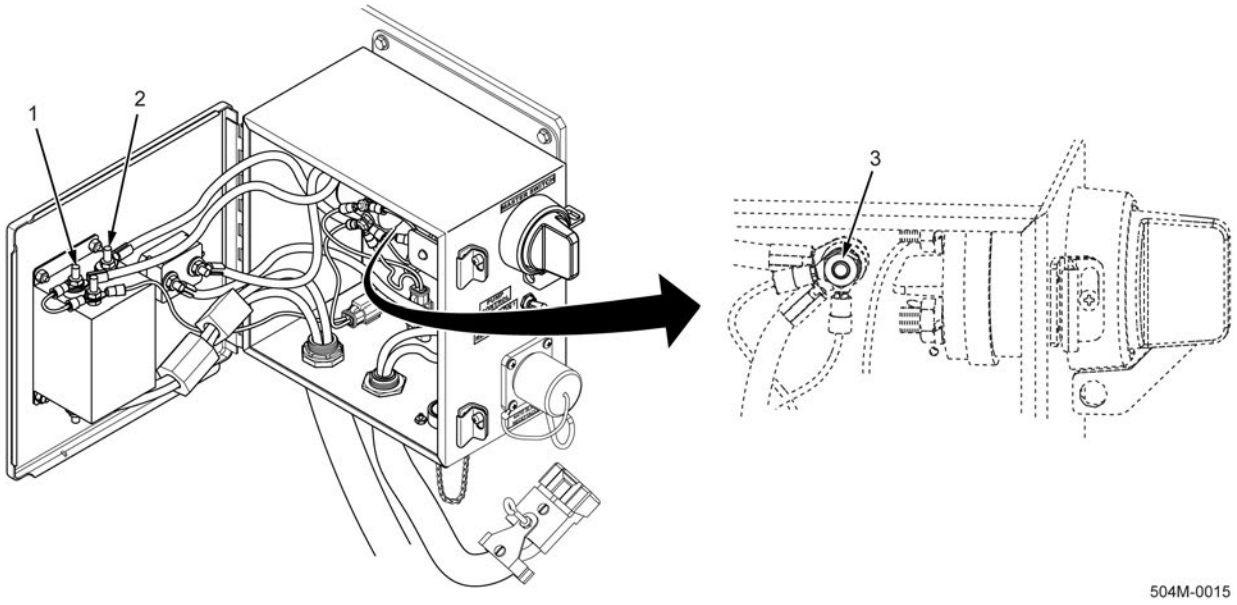


Figure 15. EMI Channel Filter Input Wire and Circuit Check.

71. Measure DC voltage.
72. Set pump control toggle switch (Figure 14, Item 2) to OFF.
73. Set master switch (Figure 14, Item 1) to OFF.

CONDITION/INDICATION

Is EMI channel filter L1 input voltage between 18 and 30 VDC?

DECISION

YES - Proceed to Step 74.
NO - Proceed to Malfunction: EMI channel filter L1 input wire faulty.

MALFUNCTION

EMI channel filter L1 input wire faulty

ACTION

1. Replace EMI channel filter L1 input wire (WP 0119).
2. Verify condition is fixed by recirculating fuel (TM 10-4930-371-10).
3. Return MFS TRM to service if condition is fixed.

STEP

74. Set digital mutimeter to measure DC voltage.
75. Set master switch (Figure 14, Item 1) to ON.
76. Set pump control toggle switch (Figure 14, Item 2) to ON.

NO POWER AT ELECTRIC MOTOR WITH MANUAL OR REMOTE ON PUMP CONTROL TOGGLE SWITCH - Continued

77. Touch positive (red) probe to EMI channel filter L1 input lug (Figure 15, Item 2), and touch negative (black) probe to EMI channel filter L2 input lug (Figure 15, Item 1).
78. Measure DC voltage.
79. Set pump control toggle switch (Figure 14, Item 2) to OFF.
80. Set master switch (Figure 14, Item 1) to OFF.

CONDITION/INDICATION

Is EMI channel filter input side voltage between 18 and 30 VDC?

DECISION

YES - Proceed to Malfunction: EMI channel filter faulty.
NO - Proceed to Malfunction: EMI channel filter L2 input wire faulty.

MALFUNCTION

EMI channel filter faulty

ACTION

1. Replace EMI channel filter (WP 0112).
2. Verify condition is fixed by recirculating fuel (TM 10-4930-371-10).
3. Return MFS TRM to service if condition is fixed.

MALFUNCTION

EMI channel filter L2 input wire faulty

ACTION

1. Replace EMI channel filter L2 input wire (WP 0119).
2. Verify condition is fixed by recirculating fuel (TM 10-4930-371-10).
3. Return MFS TRM to service if condition is fixed.

STEP

81. Set digital multimeter to measure DC voltage.
82. Touch positive (red) probe to master switch lug (Figure 16, Item 3) and touch negative (black) probe to ground lug (Figure 16, Item 2).

NO POWER AT ELECTRIC MOTOR WITH MANUAL OR REMOTE ON PUMP CONTROL TOGGLE SWITCH - Continued

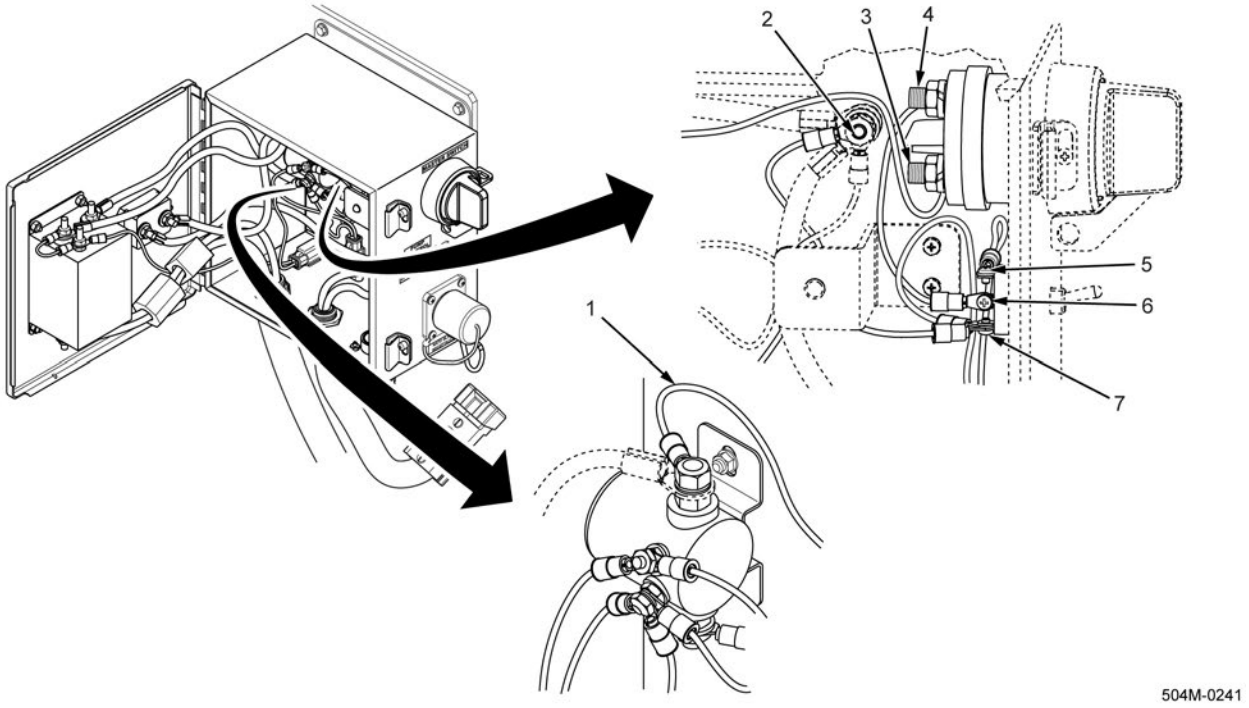


Figure 16. Switch Circuit Checks.

83. Measure DC voltage.

CONDITION/INDICATION

Is master switch input circuit voltage between 18 and 30 VDC?

DECISION

YES - Proceed to Step 84.
NO - Proceed to Malfunction: Master switch input wire faulty.

MALFUNCTION

Master switch input wire faulty

ACTION

1. Replace master switch input wire (WP 0119).
2. Verify condition is fixed by recirculating fuel (TM 10-4930-371-10).
3. Return MFS TRM to service if condition is fixed.

STEP

84. Set digital multimeter to measure DC voltage.
85. Set master switch (Figure 17, Item 1) to ON.

NO POWER AT ELECTRIC MOTOR WITH MANUAL OR REMOTE ON PUMP CONTROL TOGGLE SWITCH - Continued

86. Touch positive (red) probe to master switch lug (Figure 16, Item 4) and touch negative (black) probe to ground lug (Figure 16, Item 2).
87. Measure DC voltage.
88. Set master switch (Figure 17, Item 1) to OFF.

CONDITION/INDICATION

Is master switch output voltage between 18 and 30 VDC?

DECISION

YES - Proceed to Step 89.
NO - Proceed to Malfunction: Master switch faulty.

MALFUNCTION

Master switch faulty

ACTION

1. Replace master switch (WP 0113).
2. Verify condition is fixed by recirculating fuel (TM 10-4930-371-10).
3. Return MFS TRM to service if condition is fixed.

STEP

89. Set digital multimeter to measure DC voltage.
90. Set master switch (Figure 17, Item 1) to ON.
91. Touch positive (red) probe to pump control toggle switch lug (Figure 16, Item 6) and touch negative (black) probe to ground lug (Figure 16, Item 2).
92. Measure DC voltage.
93. Set master switch (Figure 17, Item 1) to OFF.

CONDITION/INDICATION

Is pump control toggle switch input circuit voltage between 18 and 30 VDC?

DECISION

YES - Proceed to Step 94.
NO - Proceed to Malfunction: Pump control toggle switch input wire faulty.

MALFUNCTION

Pump control toggle switch input wire faulty

ACTION

1. Replace pump control toggle switch input wire (WP 0119).
2. Verify condition is fixed by recirculating fuel (TM 10-4930-371-10).
3. Return MFS TRM to service if condition is fixed.

NO POWER AT ELECTRIC MOTOR WITH MANUAL OR REMOTE ON PUMP CONTROL TOGGLE SWITCH - Continued

STEP

94. Set digital multimeter to measure DC voltage.
95. Set master switch (Figure 17, Item 1) to ON.
96. If using manual ON position of pump control toggle switch:
    a. Set pump control toggle switch (Figure 17, Item 2) to manual ON position.
    b. Touch positive (red) probe to pump control toggle switch lug (Figure 16, Item 7) and touch negative (black) probe to ground lug (Figure 16, Item 2).
97. If using remote ON position of pump control toggle switch:
    a. Set pump control toggle switch (Figure 17, Item 2) to remote ON position.
    b. Touch positive (red) probe to pump control toggle switch lug (Figure 16, Item 5) and touch negative (black) probe to ground lug (Figure 16, Item 2).
98. Measure DC voltage.
99. Set pump control toggle switch (Figure 17, Item 2) to OFF.
100. Set master switch (Figure 17, Item 1) to OFF.

CONDITION/INDICATION

Is pump control toggle switch (Figure 14, Item 2) output voltage between 18 and 30 VDC?

DECISION

YES - If using manual ON position of pump control toggle switch proceed to Step 125, if using remote ON position of pump remote control toggle switch, proceed to Step 101.
NO - Proceed to Malfunction: Pump control toggle switch faulty.

MALFUNCTION

Pump control toggle switch faulty

ACTION

1. Replace pump control toggle switch (WP 0115).
2. Verify condition is fixed by recirculating fuel (TM 10-4930-371-10).
3. Return MFS TRM to service if condition is fixed.

STEP

101. Set digital multimeter to measure DC voltage.
102. Disconnect remote cable.
103. Set master switch (Figure 17, Item 1) to ON.
104. Set pump control toggle switch (Figure 17, Item 2) to remote ON position.

NO POWER AT ELECTRIC MOTOR WITH MANUAL OR REMOTE ON PUMP CONTROL TOGGLE SWITCH - Continued

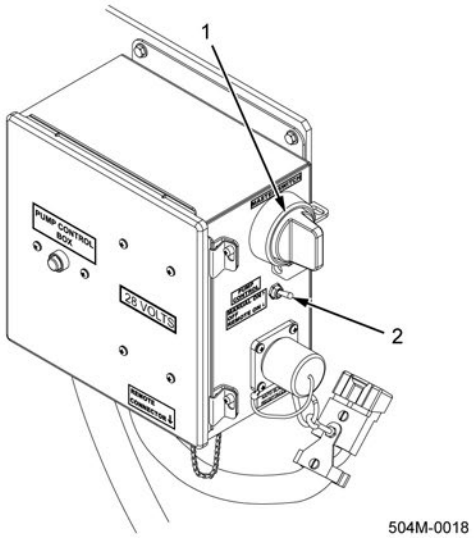


Figure 17. Switch Location.

105. Touch positive (red) probe to remote connector socket B (Figure 18, Item 4) and touch negative (black) probe to remote connector socket A (Figure 18, Item 3).

NO POWER AT ELECTRIC MOTOR WITH MANUAL OR REMOTE ON PUMP CONTROL TOGGLE SWITCH - Continued

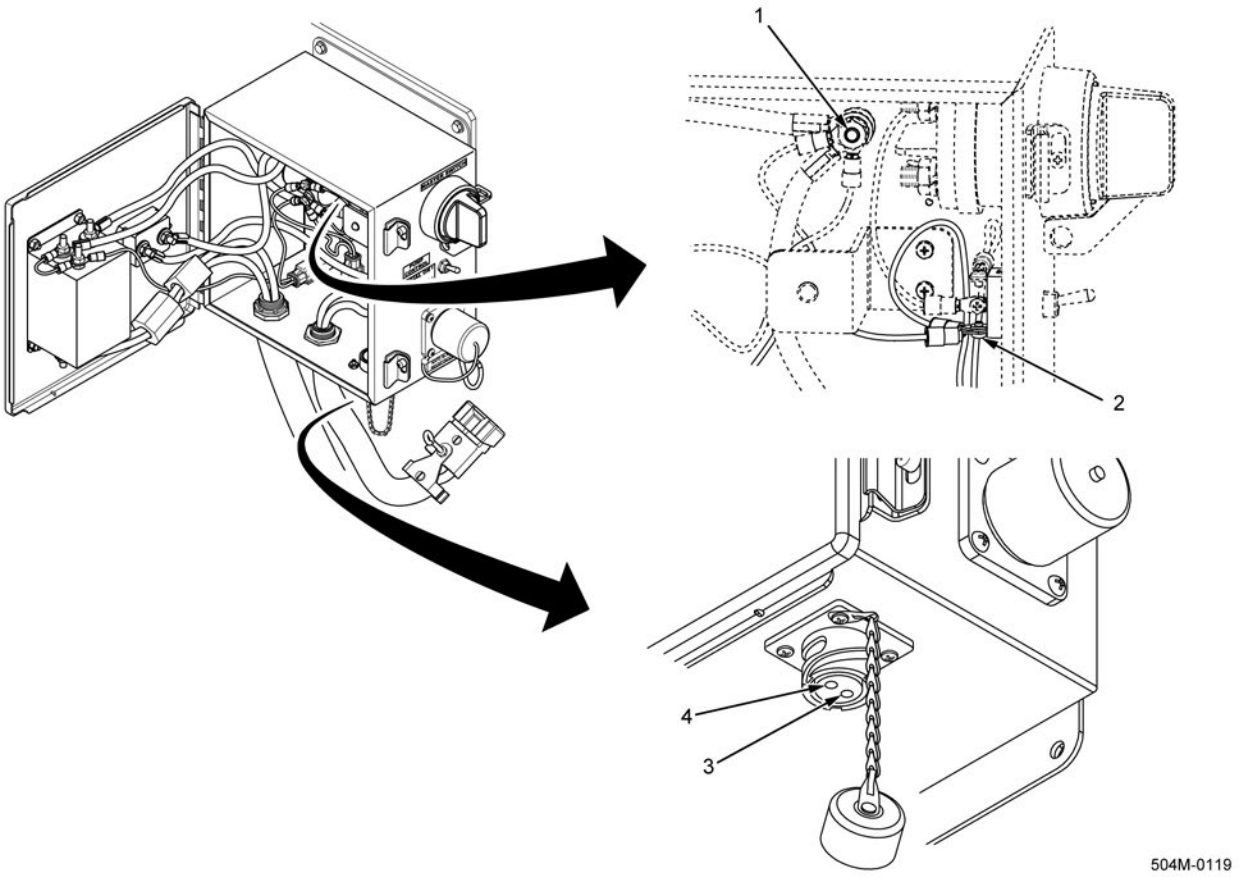


Figure 18. Remote Connector Check.

106. Measure DC voltage.
107. Turn pump control toggle switch (Figure 17, Item 2) to OFF.
108. Turn master switch (Figure 17, Item 1) to OFF.

CONDITION/INDICATION

Is remote connector input circuit voltage between 18 and 30 VDC?

DECISION

YES - Proceed to Step 109.
NO - Proceed to Malfunction: Remote connector faulty.

MALFUNCTION

Remote connector faulty

ACTION

1. Replace remote connector (WP 0117).

NO POWER AT ELECTRIC MOTOR WITH MANUAL OR REMOTE ON PUMP CONTROL TOGGLE SWITCH - Continued

2. Verify condition is fixed by recirculating fuel (TM 10-4930-371-10).
3. Return MFS TRM to service if condition is fixed.

STEP

109. Disconnect power from MFS TRM.
110. Set digital multimeter to measure resistance (ohms).
111. Touch positive (red) probe to pin (Figure 19, Item 1) and touch negative (black) probe to pin (Figure 19, Item 2).
112. Press and hold remote cable switch (Figure 19, Item 3).
113. Measure resistance.

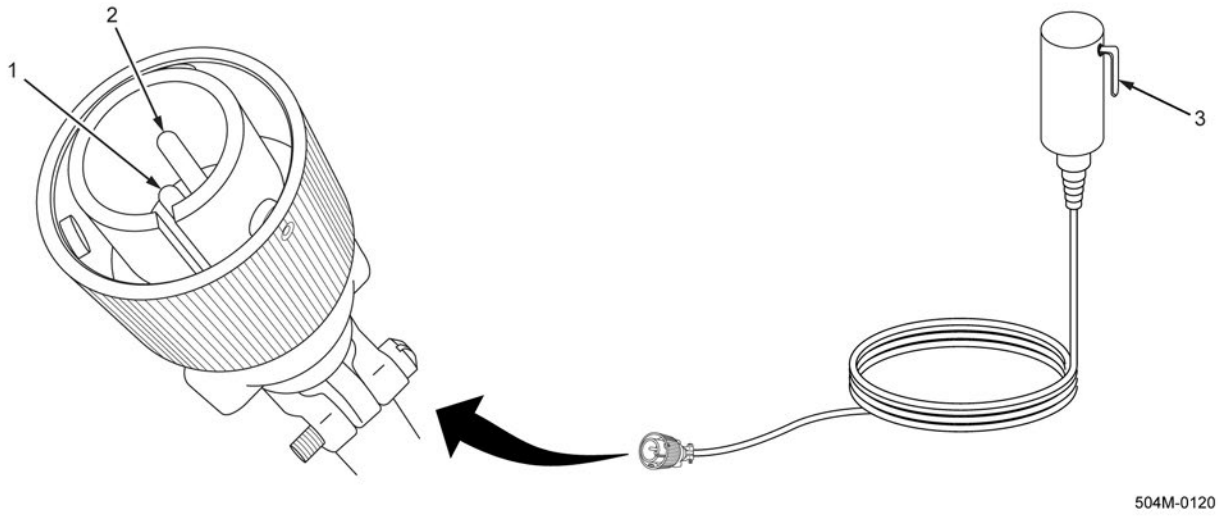


Figure 19. Remote Connector Check.

CONDITION/INDICATION

Does resistance exist between pins of remote cable?

DECISION

YES - Proceed to Step 114.
NO - Proceed to Malfunction: Remote cable faulty.

MALFUNCTION

Remote cable faulty

ACTION

1. Replace remote cable assembly (TM 10-4930-371-10).
2. Verify condition is fixed by recirculating fuel (TM 10-4930-371-10).

NO POWER AT ELECTRIC MOTOR WITH MANUAL OR REMOTE ON PUMP CONTROL TOGGLE SWITCH - Continued

3. Return MFS TRM to service if condition is fixed.

STEP

114. Connect power to MFS TRM.
115. Set digital multimeter to measure DC voltage.
116. Connect remote cable to remote connector.
117. Set master switch (Figure 17, Item 1) to ON.
118. Set pump control toggle switch (Figure 17, Item 2) to remote ON.
119. Touch positive (red) probe to pump control toggle switch lug (Figure 18, Item 2) and touch negative (black) probe to ground lug (Figure 18, Item 1).
120. Press and hold switch on remote.
121. Measure DC voltage.
122. Release switch on remote cable.
123. Set pump control toggle switch (Figure 17, Item 2) to OFF.
124. Set master switch (Figure 17, Item 1) to OFF.

CONDITION/INDICATION

Is remote connector output circuit voltage between 18 and 30 VDC?

DECISION

YES - Proceed to Step 125.
NO - Proceed to Malfunction: Remote connector faulty.

MALFUNCTION

Remote connector faulty

ACTION

1. Replace remote connector (WP 0117).
2. Verify condition is fixed by recirculating fuel (TM 10-4930-371-10).
3. Return MFS TRM to service if condition is fixed.

STEP

125. Set digital multimeter to measure DC voltage.
126. Set master switch (Figure 17, Item 1) to ON.
127. Set pump control toggle switch (Figure 17, Item 2) to manual ON.
128. Touch positive (red) probe to relay lug (Figure 20, Item 3) and touch negative (black) probe to ground lug (Figure 20, Item 1).
129. Measure DC voltage.
130. Set pump control toggle switch (Figure 17, Item 2) to OFF.
131. Set master switch (Figure 17, Item 1) to OFF.

NO POWER AT ELECTRIC MOTOR WITH MANUAL OR REMOTE ON PUMP CONTROL TOGGLE SWITCH - Continued

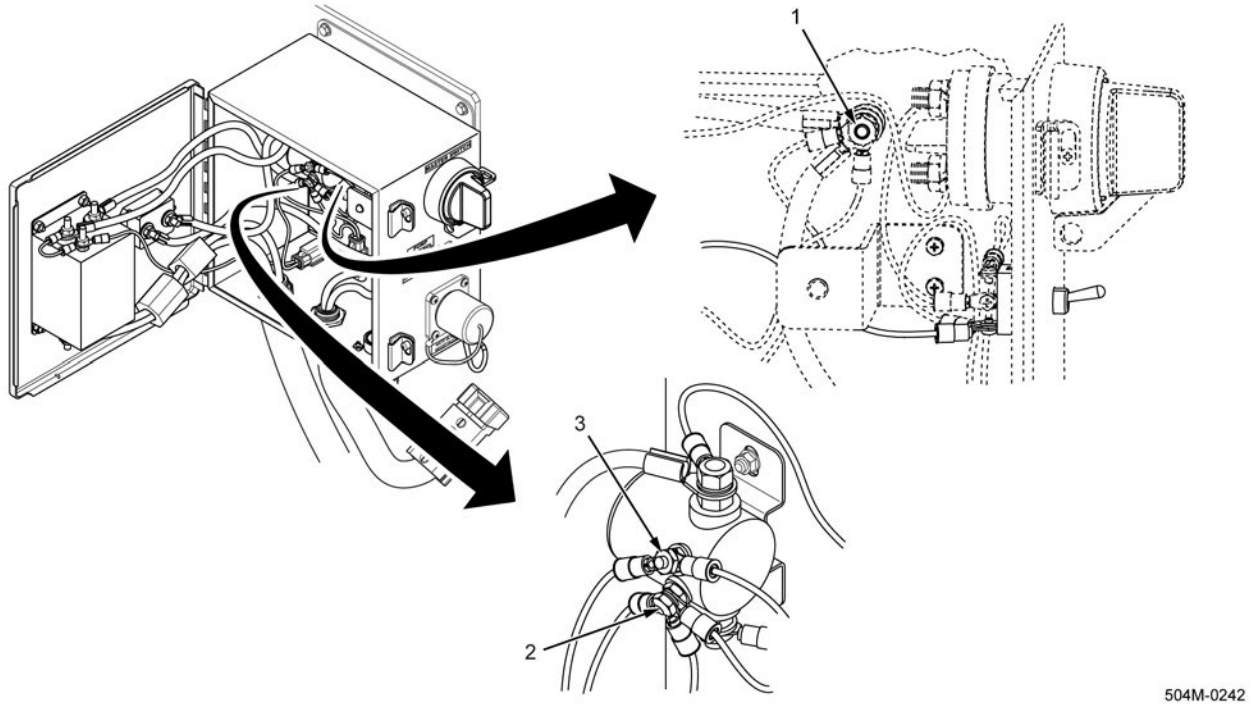


Figure 20. Pump Control Toggle Switch Output Voltage.

CONDITION/INDICATION

Is pump control toggle switch output circuit voltage between 18 and 30 VDC?

DECISION

YES - Proceed to Step 132.
NO - Proceed to Malfunction: Pump control toggle switch output wire faulty.

MALFUNCTION

Pump control toggle switch output wire faulty

ACTION

1. Replace pump control toggle switch output wire (WP 0119).
2. Verify condition is fixed by recirculating fuel (TM 10-4930-371-10).
3. Return MFS TRM to service if condition is fixed.

STEP

132. Set digital multimeter to measure DC voltage.
133. Set master switch (Figure 17, Item 1) to ON.
134. Set pump control toggle switch (Figure 17, Item 2) to manual ON.

NO POWER AT ELECTRIC MOTOR WITH MANUAL OR REMOTE ON PUMP CONTROL TOGGLE SWITCH - Continued

135. Touch positive (red) probe to relay lug (Figure 20, Item 3) and touch negative (black) probe to relay lug (Figure 20, Item 2).
136. Measure DC voltage.
137. Set pump control toggle switch (Figure 17, Item 2) to OFF.
138. Set master switch (Figure 17, Item 1) to OFF.

CONDITION/INDICATION

Is voltage between relay lugs between 18 and 30 VDC?

DECISION

YES - Proceed to Malfunction: Relay faulty.
NO - Proceed to Malfunction: Relay black ground wire faulty.

MALFUNCTION

Relay faulty

ACTION

1. Replace relay (WP 0116).
2. Verify condition is fixed by recirculating fuel (TM 10-4930-371-10).
3. Return MFS TRM to service if condition is fixed.

MALFUNCTION

Relay black ground wire faulty

ACTION

1. Replace relay black ground wire (WP 0119).
2. Verify condition is fixed by recirculating fuel (TM 10-4930-371-10).
3. Return MFS TRM to service if condition is fixed.

END OF WORK PACKAGE

MAINTAINER TROUBLESHOOTING
FUEL NOT FLOWING INTO TANK DURING BOTTOM LOADING OPERATIONS TROUBLESHOOTING PROCEDURE

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposible nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)

Materials/Parts
- Absorbent material (WP 0216, Table 1, Item 1)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer

References
- ATP 4-43

References (cont.)
- TM 10-4930-371-10
- WP 0049
- WP 0052
- WP 0078
- WP 0090
- WP 0091
- WP 0092
- WP 0144.2

Equipment Condition
- MFS TRM on ground (TM 10-4930-371-10)
- MFS TRM grounded (TM 10-4930-371-10)

Time to Complete
- 1.0 Hour(s)

GENERAL

This work package contains Maintainer troubleshooting procedures for MFS TRM. Use this work package to help isolate and correct system problems. Ensure all operator PMCS and troubleshooting procedures have been performed.

TROUBLESHOOTING PROCEDURE

FUEL NOT FLOWING INTO TANK DURING BOTTOM LOADING OPERATIONS

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Failure to comply could result in injury or death to personnel.

STEP

1. Attempt to open and close port control valve in use (Figure 1).

CONDITION/INDICATION

Does port control valve open and close properly?

DECISION

YES - Proceed to Step 2.
NO - Proceed to Malfunction: Port control valve faulty.

MALFUNCTION

Port control valve faulty

ACTION

1. Refer to appropriate work package and replace faulty port control valve:
   (WP 0091) for (V3) (Port G)
   (WP 0090) for (V4) (Port B)
   (WP 0092) for (V5) (Port A)
2. Verify condition is fixed by bottom loading fuel (TM 10-4930-371-10).
3. Continue fueling operations if condition is fixed.

FUEL NOT FLOWING INTO TANK DURING BOTTOM LOADING OPERATIONS - Continued

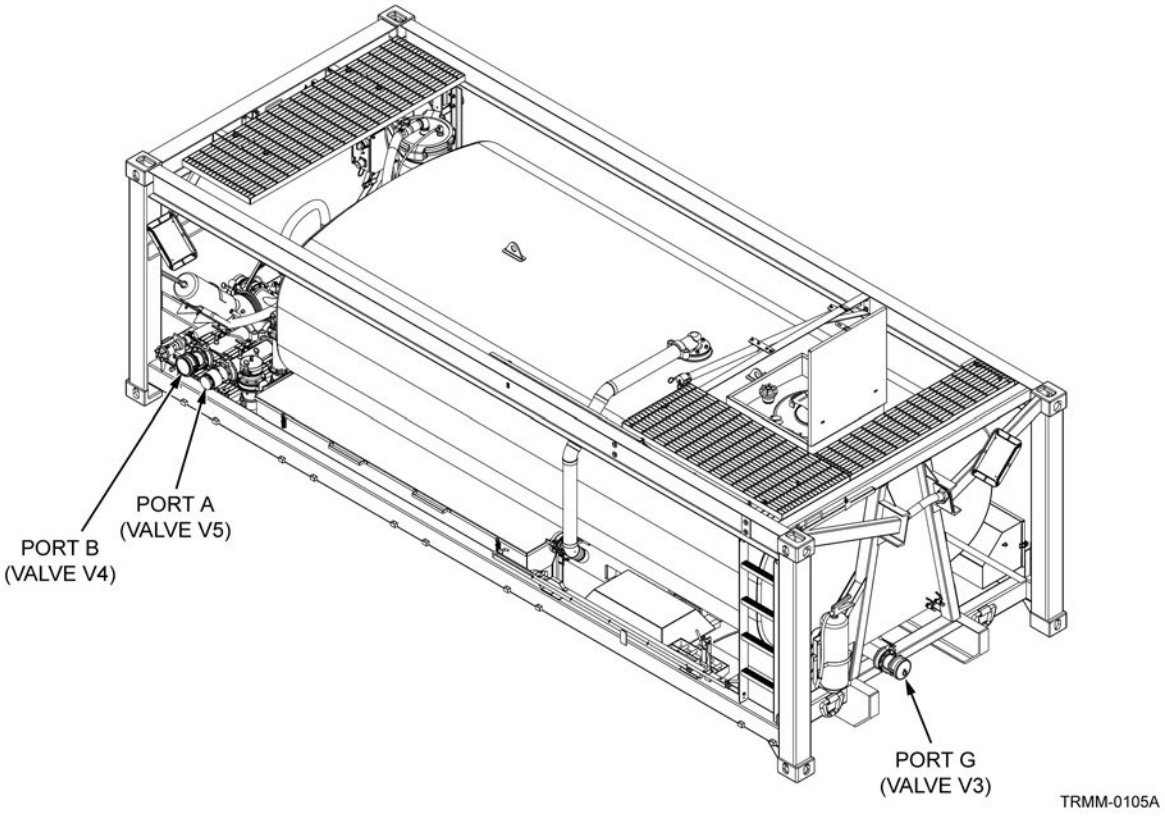


Figure 1. MFS TRM Port Control Valves.

STEP

2. Attempt to open and close bottom loading valve (V1) using control lever (Figure 2, Item 1).

FUEL NOT FLOWING INTO TANK DURING BOTTOM LOADING OPERATIONS - Continued

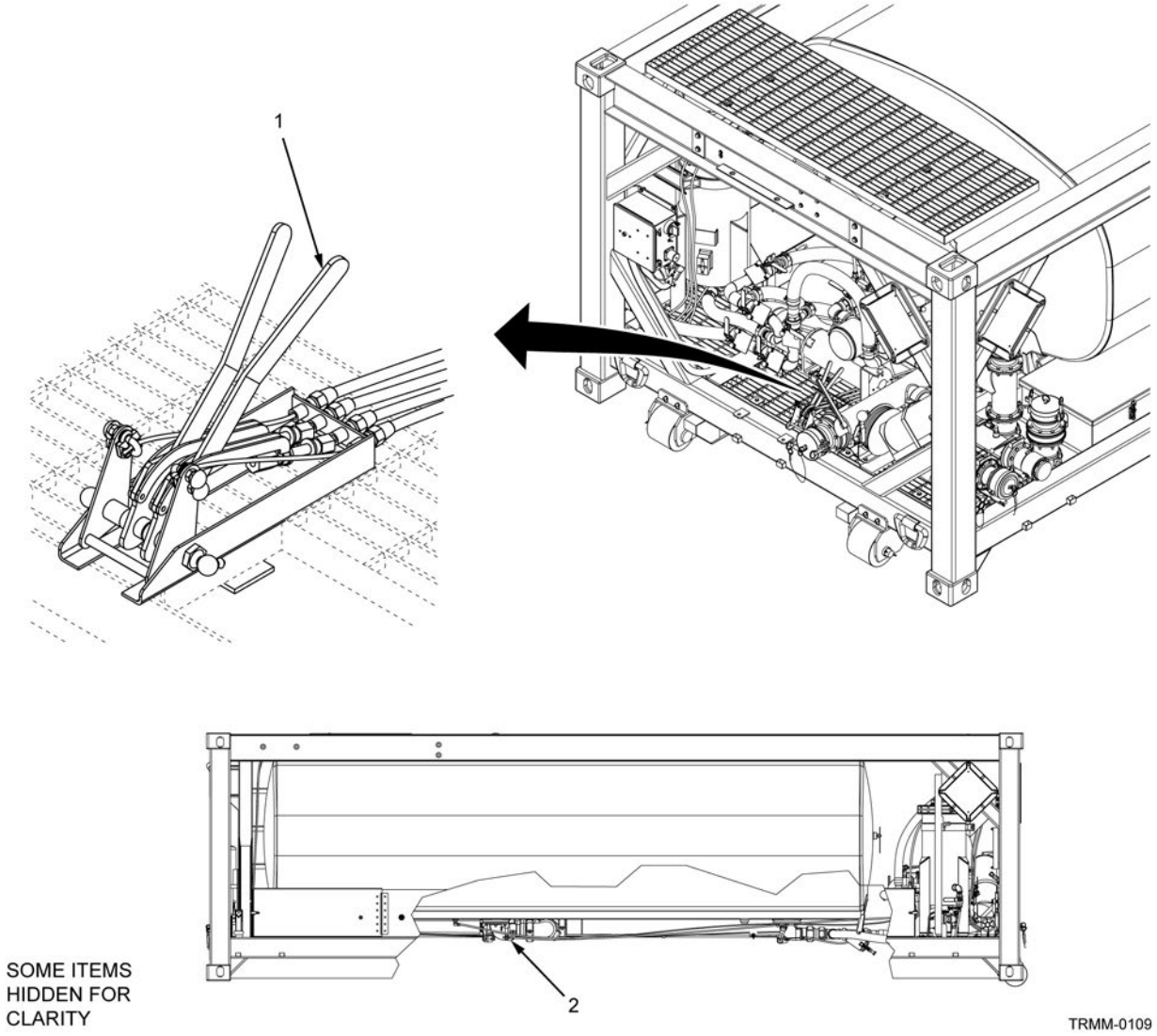


Figure 2. Bottom Loading Valve (V1).

CONDITION/INDICATION

Can bottom loading valve (V1) (Figure 2, Item 2) be opened manually?

DECISION

YES - Proceed to Step 3.
NO - Proceed to Malfunction: Bottom loading valve (V1) (Figure 2, Item 2) faulty.

MALFUNCTION

Bottom loading valve (V1) faulty

FUEL NOT FLOWING INTO TANK DURING BOTTOM LOADING OPERATIONS - Continued

ACTION

1. Replace faulty bottom loading valve (V1) (WP 0049).
2. Verify condition is fixed by bottom loading fuel (TM 10-4930-371-10).
3. Continue fueling operations if condition is fixed.

STEP

3. Open precheck valve (V16) (Figure 3, Item 1).

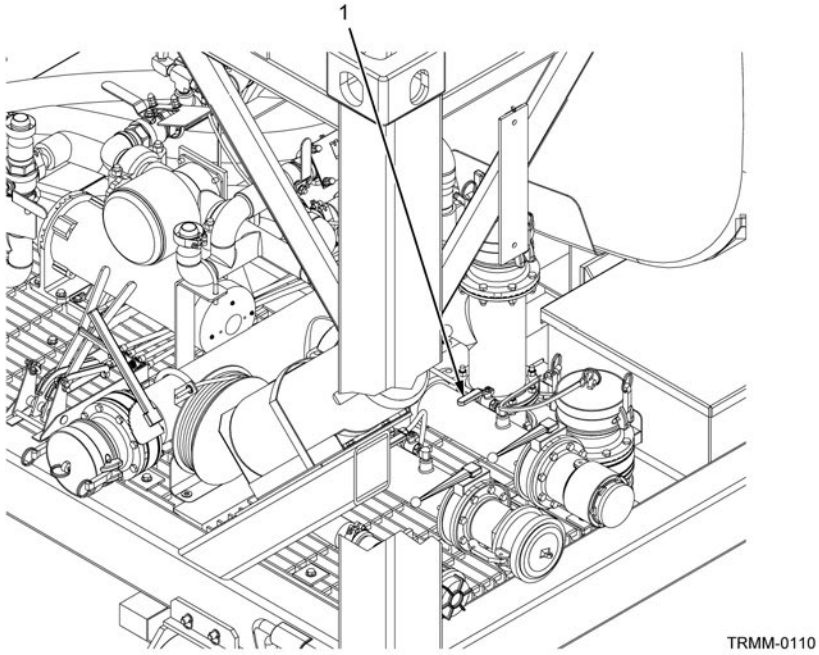


Figure 3. Precheck Valve (V16).

CONDITION/INDICATION

Can precheck valve (V16) (Figure 3, Item 1) be opened?

DECISION

YES - For TRM without ADR, proceed to Malfunction: Jet level sensor faulty.
YES - For TRM with ADR, proceed to Step 5.
NO - Proceed to Malfunction: Pre-check valve (V16) faulty.

MALFUNCTION

Jet level sensor faulty

ACTION

1. Replace faulty jet level sensor IAW (WP 0052).
2. Verify condition is fixed by bottom loading fuel (TM 10-4930-371-10).

FUEL NOT FLOWING INTO TANK DURING BOTTOM LOADING OPERATIONS - Continued

3. Continue fueling operations if condition is fixed.

MALFUNCTION

Pre-check valve (V16) faulty

ACTION

1. Replace faulty (V16) pre-check valve (Figure 3, Item 1) (WP 0078).
2. Verify condition is fixed by bottom loading fuel (TM 10-4930-371-10).
3. Continue fueling operations if condition is fixed.

STEP

NOTE

Perform Step 4 only if performing troubleshooting on TRM with ADR.

4. Load TRM with ADR on PLS trailer (TM 10-4930-371-10).
5. Remove jet sensor check valve (V19) (Figure 4, Item 2) from fitting (Figure 4, Item 1) and nipple (Figure 4, Item 3) (WP 0144.2).

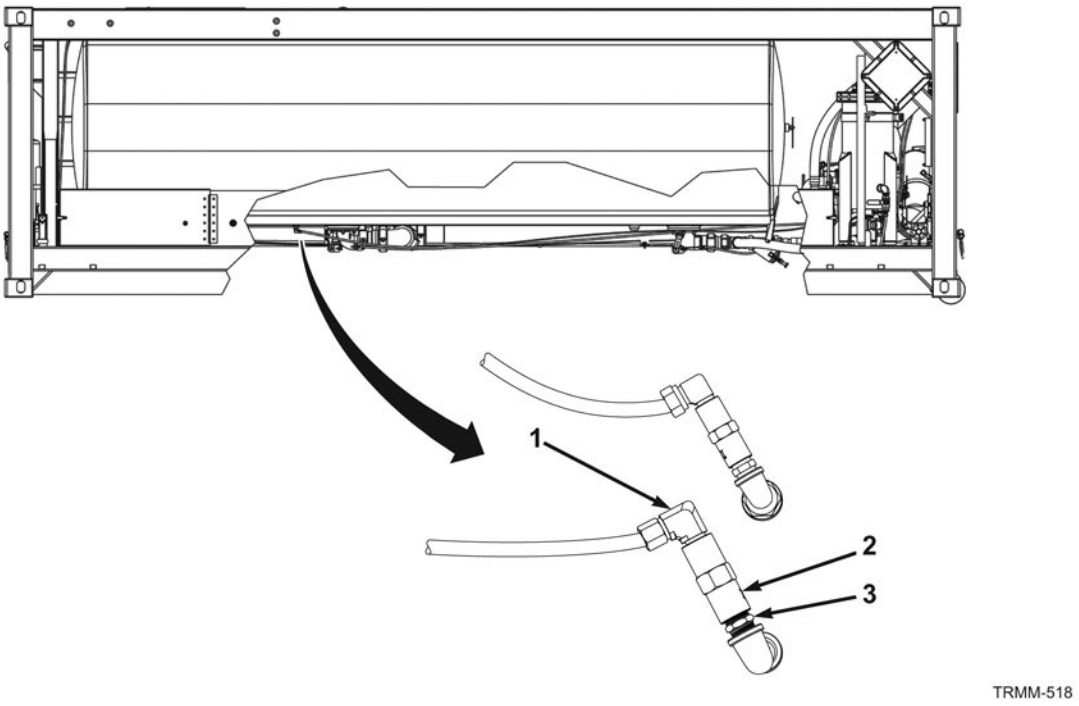


Figure 4. TRM With ADR Jet Sensor Check Valve (V19).

6. Inspect for stuck jet sensor check valve (V19) (Figure 4, Item 2). Ensure the valve is closed in line with arrows stamped on outside of valve.

FUEL NOT FLOWING INTO TANK DURING BOTTOM LOADING OPERATIONS - Continued

CONDITION/INDICATION

Is jet sensor check valve (V19) (Figure 4, Item 2) stuck closed?

DECISION

YES - Proceed to Malfunction: Jet sensor check valve (V19) faulty.
NO - Proceed to Malfunction: Jet level sensor faulty.

MALFUNCTION

Jet sensor check valve (V19) faulty

ACTION

1. Replace jet sensor check valve (V19) (WP 0144.2).
2. Verify condition is fixed by bottom loading fuel (TM 10-4930-371-10).
3. Continue fueling operations if condition is fixed.

MALFUNCTION

Jet level sensor faulty

ACTION

1. Replace faulty jet level sensor IAW (WP 0052).
2. Install jet sensor check valve (V19) (Figure 4, Item 2).
3. Verify condition is fixed by bottom loading fuel (TM 10-4930-371-10).
4. Continue fueling operations if condition is fixed.

END OF WORK PACKAGE

MAINTAINER TROUBLESHOOTING
FUEL PUMP ASSEMBLY RUNS BUT FUEL DOES NOT FLOW FROM THE TANK DISCHARGE VALVE (V2) TROUBLESHOOTING PROCEDURE

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposable nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)

Materials/Parts
- Absorbent material (WP 0216, Table 1, Item 1)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer

References
- ATP 4-43

References (cont.)
- TM 10-4930-371-10
- WP 0050
- WP 0051
- WP 0073
- WP 0101
- WP 0102

Equipment Condition
- MFS TRM loaded on PLS trailer (TM 10-4930-371-10)
- MFS TRM prepared for use (TM 10-4930-371-10)

Time to Complete
- 1.5 Hour(s)

GENERAL

This work package contains Maintainer troubleshooting procedures for MFS TRM. Use this work package to help isolate and correct system problems. Ensure all operator PMCS and troubleshooting procedures have been performed.

TROUBLESHOOTING PROCEDURE

FUEL PUMP ASSEMBLY RUNS BUT FUEL DOES NOT FLOW FROM THE TANK DISCHARGE VALVE (V2)

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Failure to comply could result in injury or death to personnel.

STEP

1. Attempt to fully open and close tank discharge valve (V2) with (V2) control valve lever (Figure 1, Item 1).

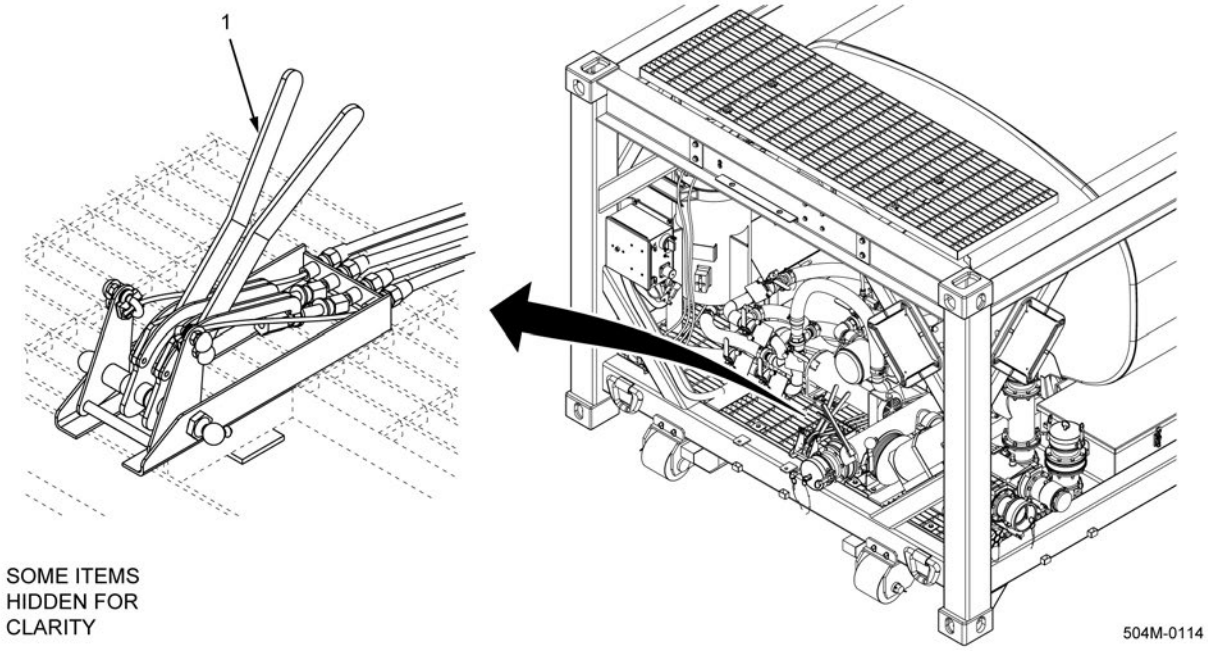


Figure 1. MFS TRM Port Control Valves.

FUEL PUMP ASSEMBLY RUNS BUT FUEL DOES NOT FLOW FROM THE TANK DISCHARGE VALVE (V2) - Continued

CONDITION/INDICATION

Is control cable intact?

DECISION

YES - Proceed to Step 2.
NO - Proceed to Step 4.

STEP

2. Pull the tank discharge valve (V2) lever (Figure 1, Item 1) to verify that the tension is present to ensure the valve is operating properly when the lever is pulled.

CONDITION/INDICATION

Is the control cable tension present?

DECISION

YES - Proceed to Step 3.
NO - Proceed to Malfunction: Broken fusible link and/or cable is out of adjustment.

MALFUNCTION

Broken fusible link and/or cable is out of adjustment

ACTION

1. If the fusible link (Figure 2, Item 1) is broken, replace the fusible link (WP 0051).
2. Adjust the control cable (Figure 2, Item 2) (WP 0073).
3. Verify condition is fixed by recirculating fuel (TM 10-4930-371-10).
4. If condition still exists, proceed to Step 3.
5. Continue fueling operations if condition is fixed.

FUEL PUMP ASSEMBLY RUNS BUT FUEL DOES NOT FLOW FROM THE TANK DISCHARGE VALVE (V2) - Continued

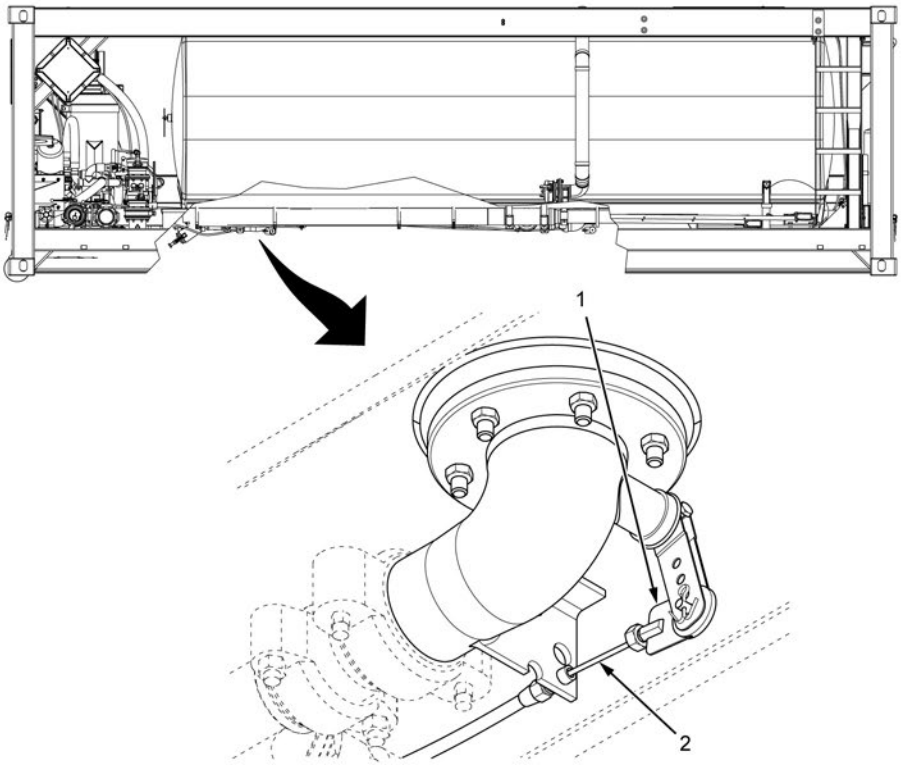


Figure 2. Tank Discharge Valve (V2) Fusible Link.

FUEL PUMP ASSEMBLY RUNS BUT FUEL DOES NOT FLOW FROM THE TANK DISCHARGE VALVE (V2) - Continued

STEP

3. Check strainer assembly (Figure 3, Item 1) for damage, leaks, or other conditions that would render it unserviceable, and if necessary clean strainer assembly (WP 0102).

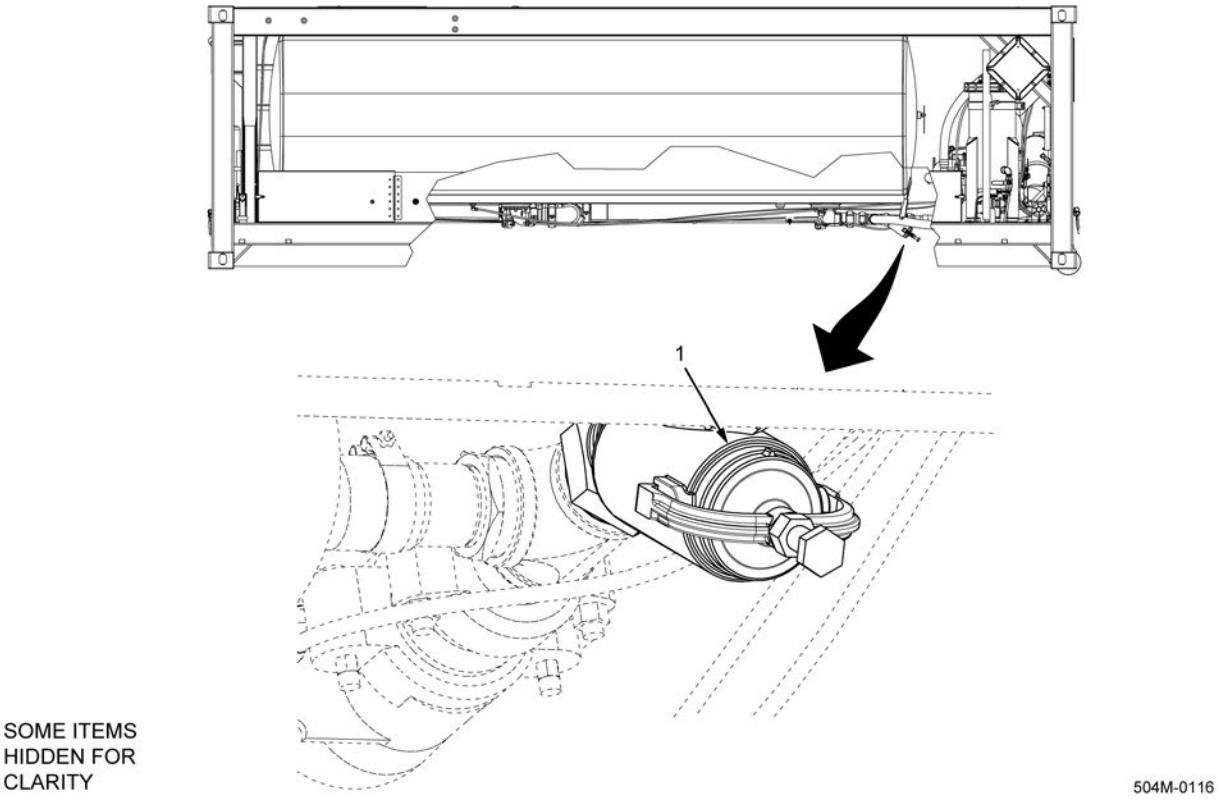


Figure 3. Strainer Assembly.

CONDITION/INDICATION

Is strainer assembly (Figure 3, Item 1) damaged or leaking?

DECISION

YES - Proceed to Malfunction: Strainer assembly damaged or leaking.
NO - Continue fueling operations.

MALFUNCTION

Strainer assembly damaged or leaking

ACTION

1. Repair strainer assembly (WP 0101).
2. Verify condition is fixed by recirculating fuel (TM 10-4930-371-10).
3. Continue fueling operations if condition is fixed.

FUEL PUMP ASSEMBLY RUNS BUT FUEL DOES NOT FLOW FROM THE TANK DISCHARGE VALVE (V2) - Continued

STEP

4. Verify that the control cable (Figure 4, Item 2) is properly attached to the fusible link (Figure 4, Item 1).

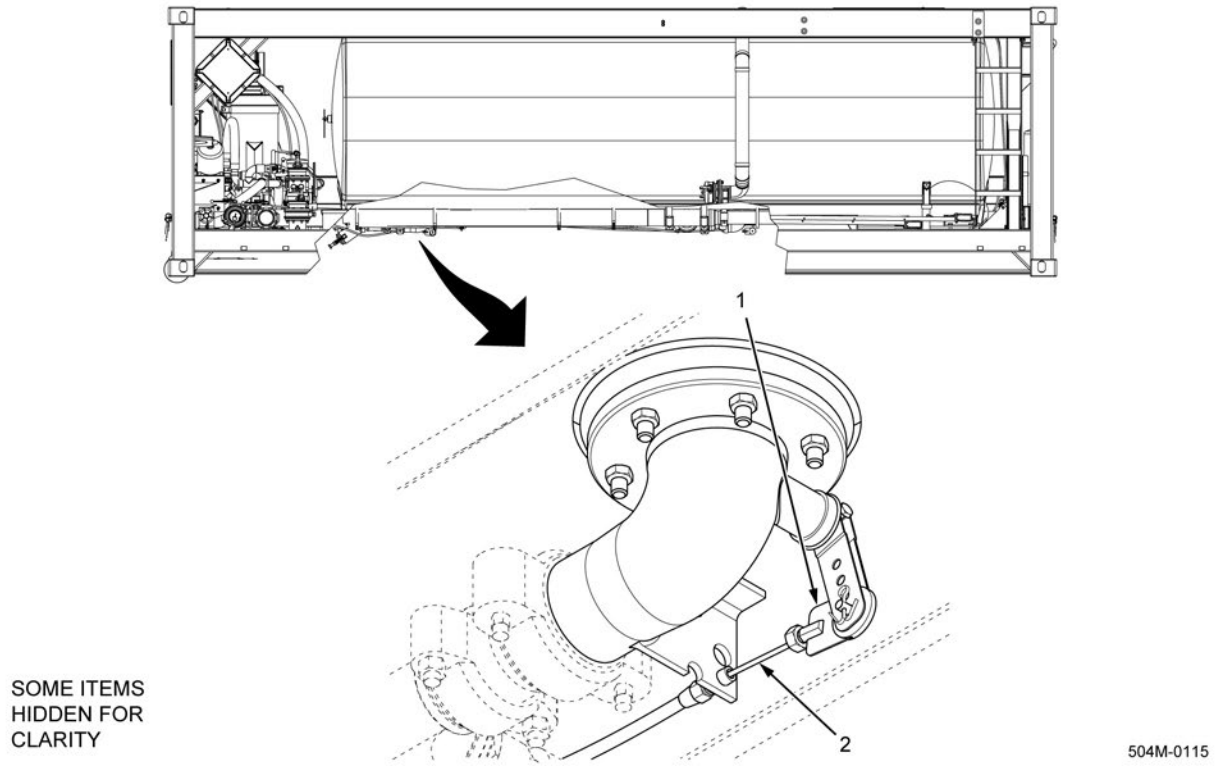


Figure 4. Tank Discharge Valve (V2) Fusible Link.

CONDITION/INDICATION

Is the control cable (Figure 4, Item 2) attached to the fusible link (Figure 4, Item 1)?

DECISION

YES - Proceed to Step 5.
NO - Proceed to Malfunction: Control cable not properly attached.

MALFUNCTION

Control cable not properly attached

ACTION

1. Ensure control cable (Figure 5, Item 2) is pulled through fusible link slot (Figure 5, Item 5) and nut (Figure 5, Item 1).

FUEL PUMP ASSEMBLY RUNS BUT FUEL DOES NOT FLOW FROM THE TANK DISCHARGE VALVE (V2) - Continued

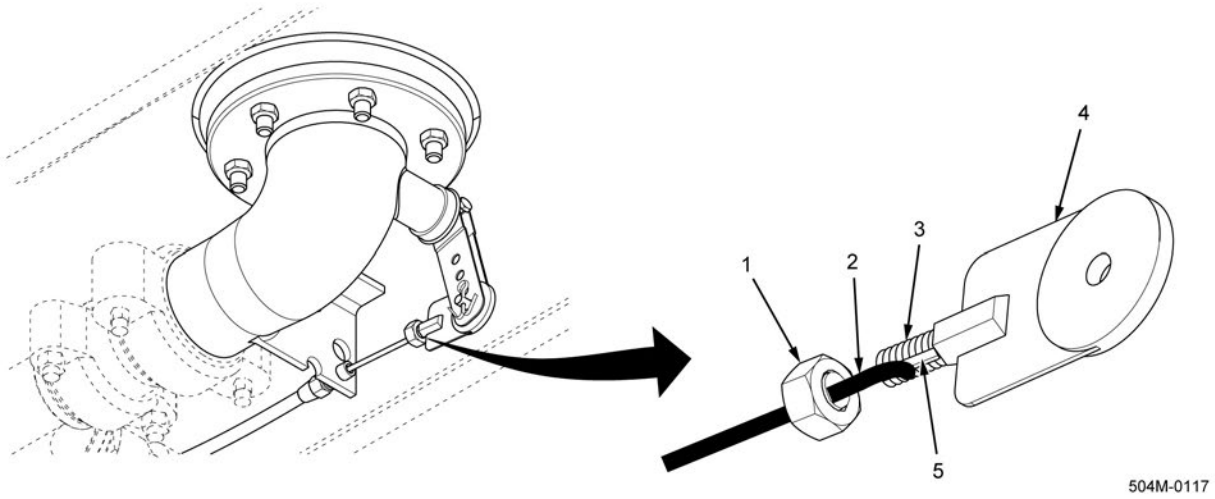


Figure 5. Fusible Link.

2. Tighten nut (Figure 5, Item 1) on stud (Figure 5, Item 3) to secure the control cable (Figure 5, Item 2) to the fusible link (Figure 5, Item 4).
3. Adjust control cable tension until there is no slack (WP 0073).
4. Verify condition is fixed by recirculating fuel (TM 10-4930-371-10).
5. If condition still exists, proceed to Step 2.
6. Continue fueling operations if condition is fixed.

FUEL PUMP ASSEMBLY RUNS BUT FUEL DOES NOT FLOW FROM THE TANK DISCHARGE VALVE (V2) - Continued

STEP

5. Verify the fusible link (Figure 6, Item 4) is properly attached to the lever (Figure 6, Item 1).

CONDITION/INDICATION

Is the fusible link (Figure 6, Item 4) attached to the lever (Figure 6, Item 1)?

DECISION

YES - Continue fueling operations.
NO - Proceed to Malfunction: Fusible link not attached.

MALFUNCTION

Fusible link not attached

ACTION

1. Put the fusible link (Figure 6, Item 4) back in the lever (Figure 6, Item 1) with clevis pin (Figure 6, Item 3) and secure with cotter pin (Figure 6, Item 2).
2. Adjust control cable (Figure 6, Item 5) tension until there is no slack (WP 0073).
3. Verify condition is fixed by recirculating fuel (TM 10-4930-371-10).
4. If condition still exists, replace tank discharge valve (V2) (WP 0050).
5. Continue fueling operations if condition is fixed.

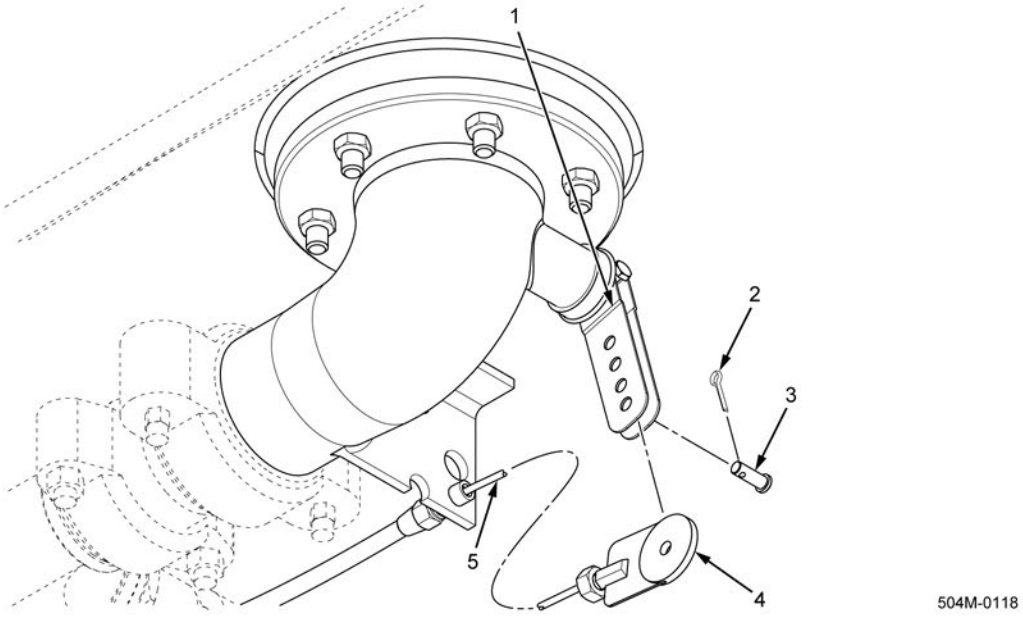


Figure 6. Tank Discharge Valve (V2).

END OF WORK PACKAGE

MAINTAINER TROUBLESHOOTING
FUEL PUMP ASSEMBLY RUNS BUT FLOW RATE IS LOW TROUBLESHOOTING PROCEDURE

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposable nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)

Materials/Parts
- Absorbent material (WP 0216, Table 1, Item 1)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer

References
- ATP 4-43
- TM 10-4930-371-10
- WP 0102
- WP 0103
- WP 0134
- WP 0144.2

Equipment Condition
- MFS TRM prepared for use (TM 10-4930-371-10)
- MFS TRM loaded on PLS trailer (TM 10-4930-371-10)

Time to Complete
- 1.0 Hour(s)

GENERAL

This work package contains Maintainer troubleshooting procedures for MFS TRM. Use this work package to help isolate and correct system problems. Ensure all operator PMCS and troubleshooting procedures have been performed.

TROUBLESHOOTING PROCEDURE

FUEL PUMP ASSEMBLY RUNS BUT FLOW RATE IS LOW

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Failure to comply could result in injury or death to personnel.

STEP

1. While pumping fuel, check differential pressure gauge (Figure 1, Item 1).

FUEL PUMP ASSEMBLY RUNS BUT FLOW RATE IS LOW - Continued

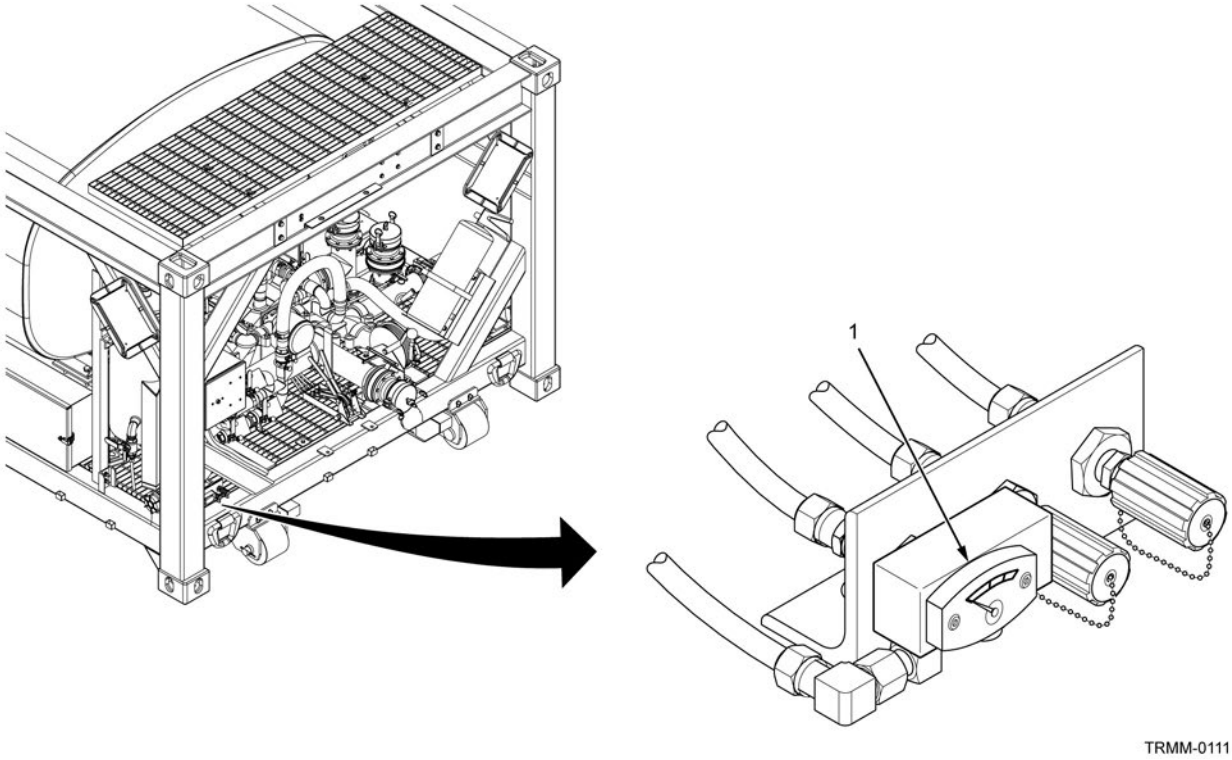


Figure 1. Differential Pressure Gauge.

CONDITION/INDICATION

Is differential pressure gauge (Figure 1, Item 1) indicator in the red area of the gauge?

DECISION

YES - Proceed to Malfunction: Filter/separator elements clogged or contaminated.
NO - If no fuel flow, proceed to Step 2.

MALFUNCTION

Filter/separator elements clogged or contaminated

ACTION

1. Shut down MFS TRM (TM 10-4930-371-10).
2. Replace filter/separator elements (WP 0134).
3. Verify condition is fixed by recirculating fuel (TM 10-4930-371-10).
4. Continue fueling operations if condition is fixed.

STEP

2. Set up MFS TRM to pump fuel from Port D or Port E (TM 10-4930-371-10).
3. Configure valves as follows to bypass flow meter assembly:

FUEL PUMP ASSEMBLY RUNS BUT FLOW RATE IS LOW - Continued

a. Open tank discharge valve (V2) (Figure 2, Item 3).
b. Open pump discharge ball valve (V10) (Figure 2, Item 1).
c. Open evacuation return ball valve (V15) (Figure 2, Item 2).
d. Pump fuel and calculate rate manually.
e. Close all valves.

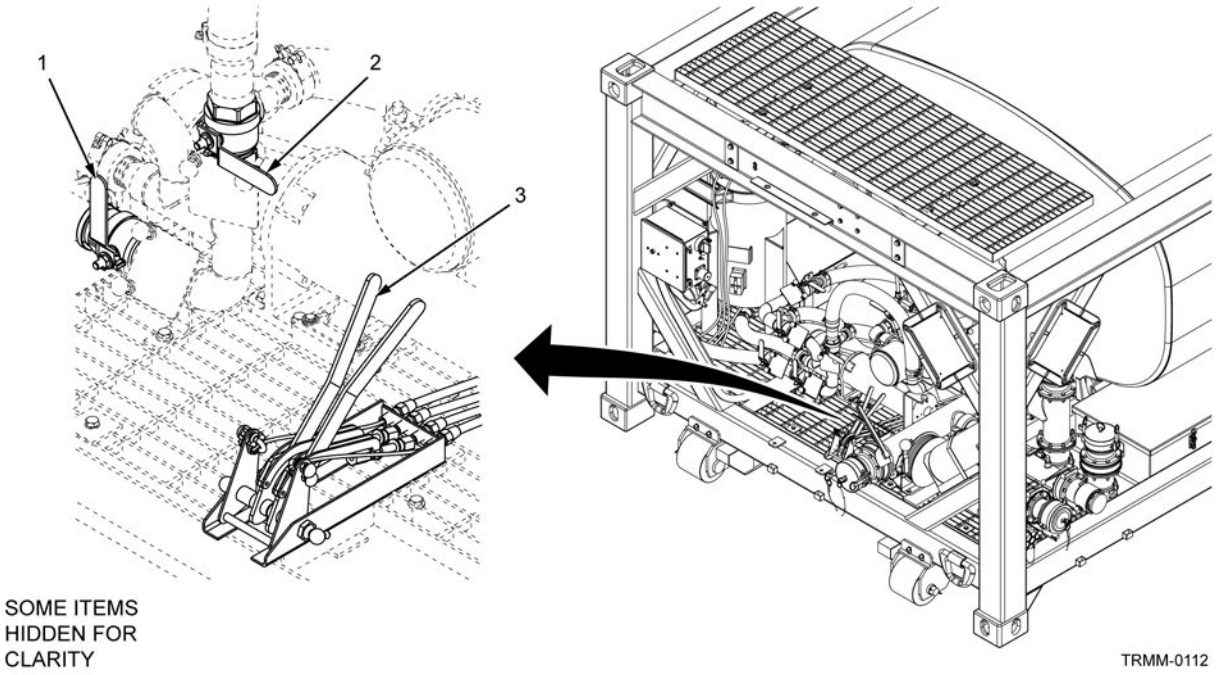


Figure 2. Checking Flow Meter Assembly Operation.

CONDITION/INDICATION

Does fuel flow at a rate of at least 20 gpm?

DECISION

YES - Proceed to Malfunction: Flow meter assembly faulty.
NO - Proceed to Malfunction: Strainer assembly dirty or clogged.
NO - For TRM with ADR, proceed to Step 4.

MALFUNCTION

Flow meter assembly faulty

ACTION

1. Replace flow meter assembly (WP 0103).
2. Verify condition is fixed by recirculating fuel (TM 10-4930-371-10).
3. Continue fueling operations if condition is fixed.

FUEL PUMP ASSEMBLY RUNS BUT FLOW RATE IS LOW - Continued

MALFUNCTION

Strainer assembly dirty or clogged

ACTION

1. Clean strainer assembly (WP 0102).
2. Verify condition is fixed by recirculating fuel (TM 10-4930-371-10).
3. Continue fueling operations if condition is fixed.

STEP

4. Remove air elimination check valve (V18) (Figure 3, Item 2) from fitting (Figure 3, Item 1) and nipple (Figure 3, Item 3) (WP 0144.2).

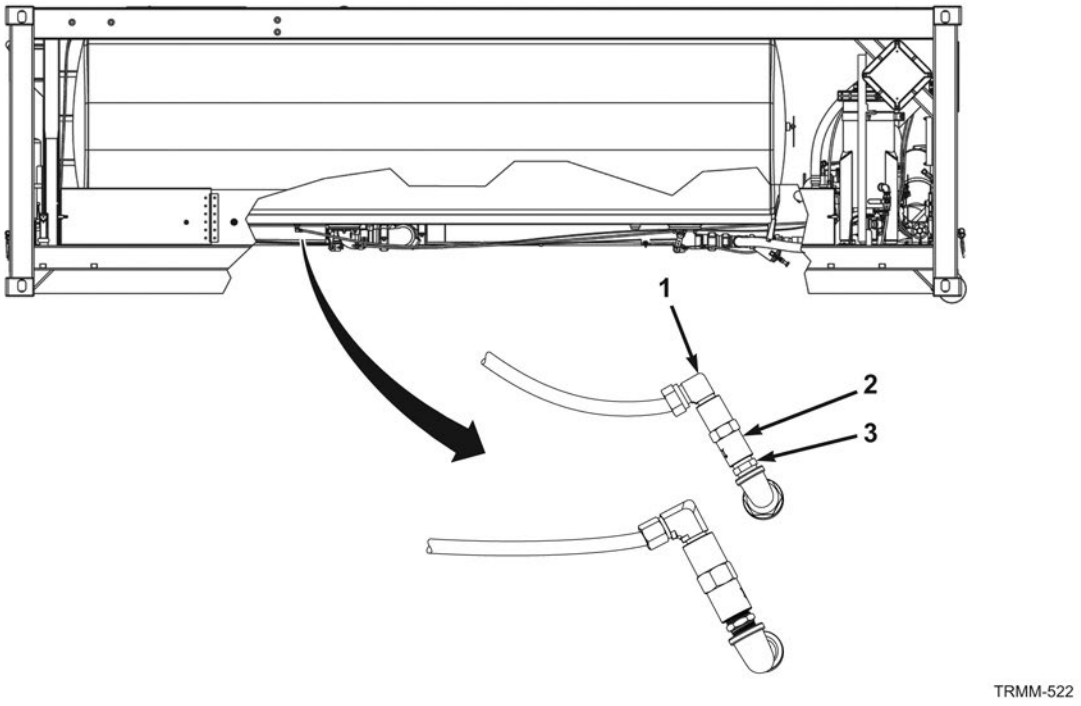


Figure 3. TRM With ADR Air Elimination Check Valve (V18).

5. Inspect for stuck air elimination check valve (V18) (Figure 3, Item 2). Ensure the valve is closed in line with arrows stamped on outside of valve.

CONDITION/INDICATION

Is air elimination check valve (V18) (Figure 3, Item 2) stuck closed?

DECISION

YES - Proceed to Malfunction: Air elimination check valve (V18) faulty.
NO - Proceed to Malfunction: Strainer assembly dirty or clogged.

FUEL PUMP ASSEMBLY RUNS BUT FLOW RATE IS LOW - Continued

MALFUNCTION

Air elimination check valve (V18) faulty

ACTION

1. Replace air elimination check valve (V18) (WP 0144.2).
2. Verify condition is fixed by bottom loading fuel (TM 10-4930-371-10).
3. Continue fueling operations if condition is fixed.

MALFUNCTION

Strainer assembly dirty or clogged

ACTION

1. Clean strainer assembly (WP 0102).
2. Install air elimination check valve (V18).
3. Verify condition is fixed by bottom loading fuel (TM 10-4930-371-10).
4. Continue fueling operations if condition is fixed.

END OF WORK PACKAGE

MAINTAINER TROUBLESHOOTING
FUEL NOT FLOWING FROM TANK DURING GRAVITY DISCHARGE OPERATIONS TROUBLESHOOTING PROCEDURE

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposable nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)
- Pan, drip (WP 0217, Table 1, Item 8)

Materials/Parts
- Absorbent material (WP 0216, Table 1, Item 1)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer (2)

References
- ATP 4-43
- TM 10-4930-371-10

References (cont.)
- WP 0002
- WP 0050
- WP 0073
- WP 0075
- WP 0086
- WP 0087
- WP 0095
- WP 0106

Equipment Condition
- MFS TRM loaded on PLS trailer (TM 10-4930-371-10)
- MFS TRM grounded (TM 10-4930-371-10)
- Ladder platform emplaced (TM 10-4930-371-10)
- Ladder emplaced (TM 10-4930-371-10)

Time to Complete
- 1.2 Hour(s)

GENERAL

This work package contains Maintainer troubleshooting procedures for MFS TRM. Use this work package to help isolate and correct system problems. Ensure all operator PMCS and troubleshooting procedures have been performed.

This work package pertains to Gravity Discharge through ports D (V8) and E (V7).

TROUBLESHOOTING PROCEDURE

FUEL NOT FLOWING FROM TANK DURING GRAVITY DISCHARGE OPERATIONS

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Failure to comply could result in injury or death to personnel.

STEP

1. Place drip pan to catch residual fuel under port control valve.
2. Attempt to fully open and close port control valve in use (Figure 1).
3. For TRM with ADR, ensure secondary manual shutoff valves V21 and V22 valves are fully OPEN. Refer to (WP 0002).

CONDITION/INDICATION

Does port control valve (Figure 1) fail to fully open and close?

DECISION

YES - Proceed to Malfunction: Port control valve faulty.
NO - Proceed to Step 4.

MALFUNCTION

Port control valve faulty

ACTION

1. Replace defective port control valve:

   For Port E (V7) or Port D (V8), refer to (WP 0095).
2. Verify condition is fixed by performing gravity discharge operation (TM 10-4930-371-10).
3. Continue fueling operations if condition is fixed.

FUEL NOT FLOWING FROM TANK DURING GRAVITY DISCHARGE OPERATIONS - Continued

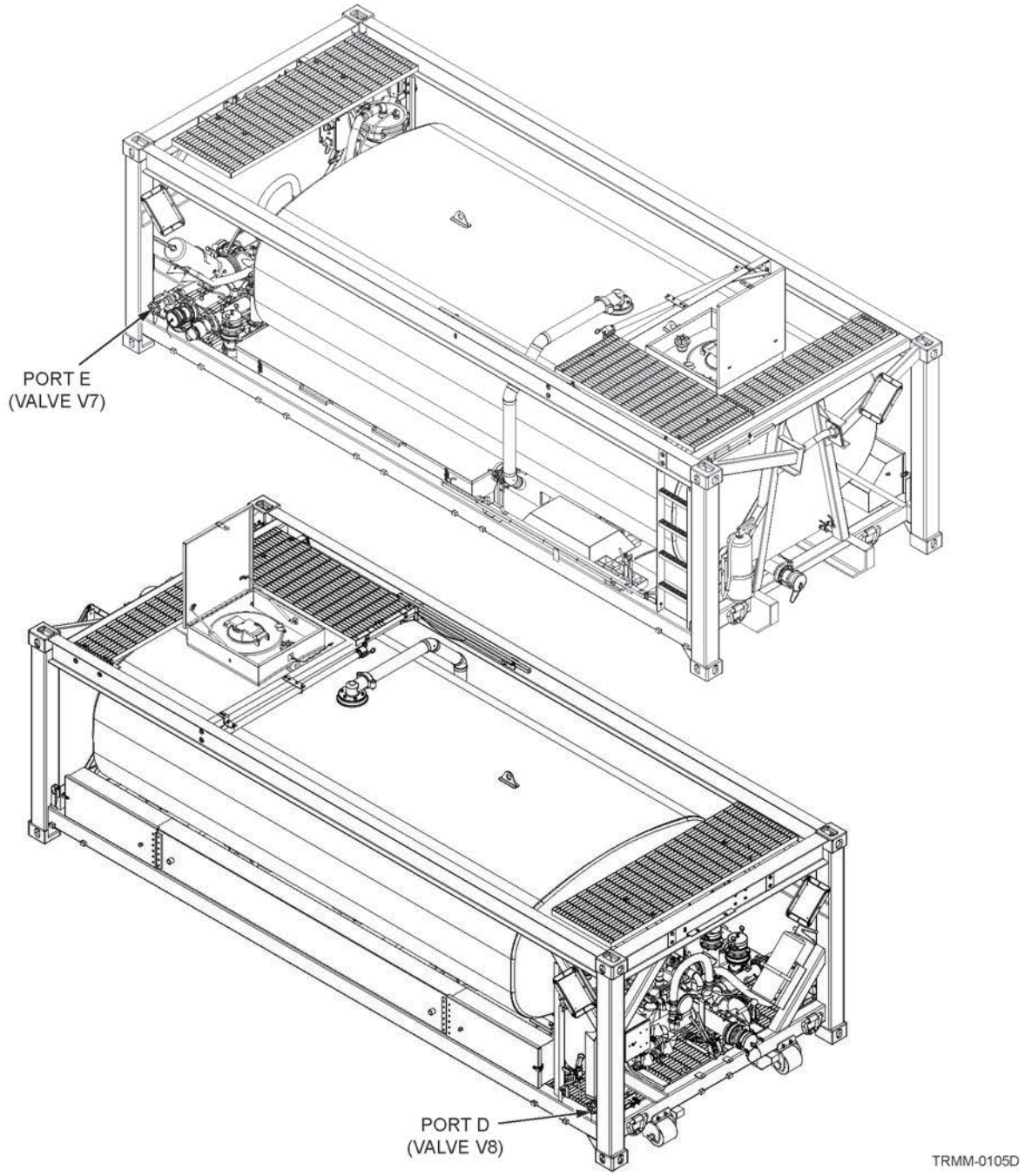


Figure 1. MFS TRM Port Control Valves.

STEP

4. For discharge through ports D and E (Figure 1), attempt to fully open and close ball valves (V10) (Figure 2, Item 5), (V11) (Figure 2, Item 1), (V12) (Figure 2, Item 2) and (V13) (Figure 2, Item 3).

FUEL NOT FLOWING FROM TANK DURING GRAVITY DISCHARGE OPERATIONS - Continued

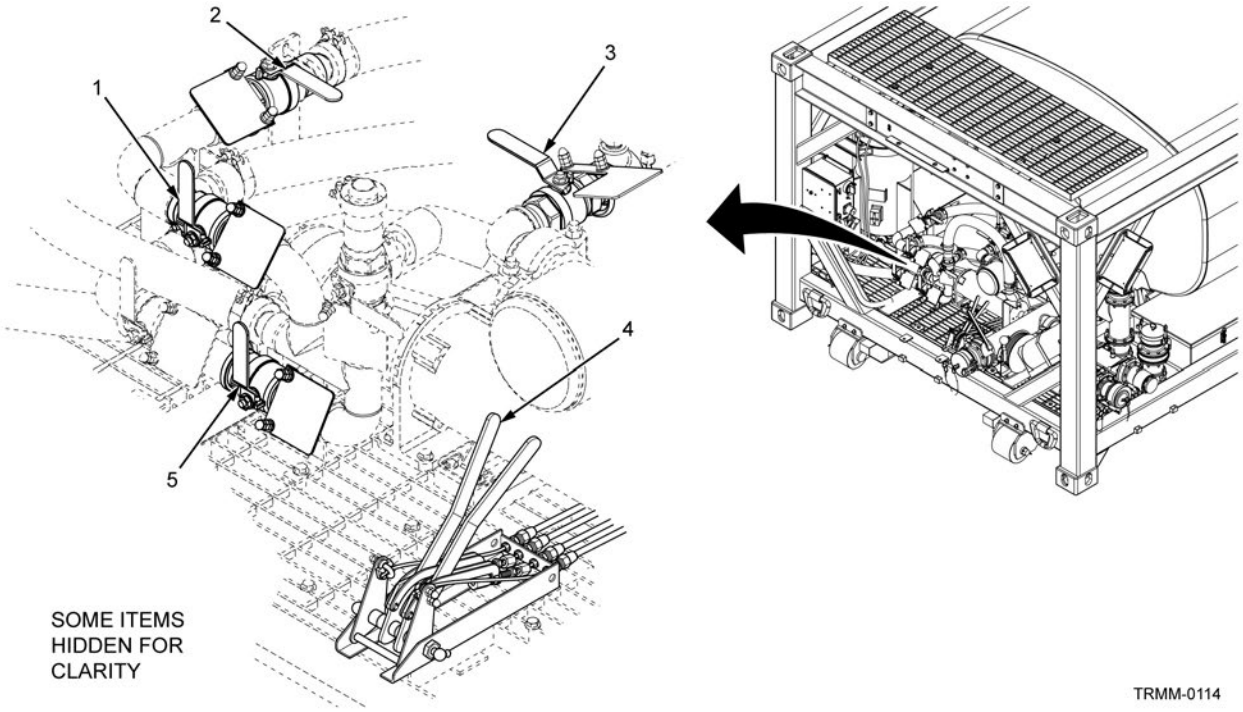


Figure 2. Ball Valves (V10), (V11), (V12, (V13) and Tank Discharge Valve (V2) Control Lever.

FUEL NOT FLOWING FROM TANK DURING GRAVITY DISCHARGE OPERATIONS - Continued

CONDITION/INDICATION

Does any valve fail to fully open and close?

DECISION

YES - Proceed to Malfunction: Ball valve faulty.
NO - Proceed to Step 5.

MALFUNCTION

Ball valve faulty

ACTION

1. Replace faulty ball valve:

   For ball valve (V10) and ball valve (V11), refer to (WP 0086).

   For ball valve (V12), refer to (WP 0087).

   For ball valve (V13), refer to (WP 0106).

2. Verify condition is fixed by performing gravity discharge operation (TM 10-4930-371-10).
3. Continue fueling operations if condition is fixed.

STEP

5. While observing tank discharge valve (V2) (Figure 3), open and close it using control lever (Figure 2, Item 4).

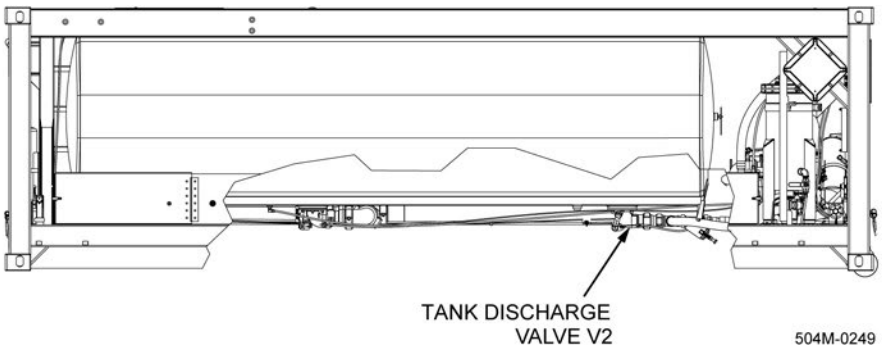


Figure 3. Tank Discharge Valve (V2).

CONDITION/INDICATION

Does control lever have too much slack to operate tank discharge valve (V2) (Figure 4)?

DECISION

YES - Proceed to Malfunction: Control cable out of adjustment.
NO - Proceed to Step 6.

MALFUNCTION

Control cable out of adjustment

FUEL NOT FLOWING FROM TANK DURING GRAVITY DISCHARGE OPERATIONS - Continued

ACTION

Adjust tank discharge valve (V2) control cable (WP 0073).

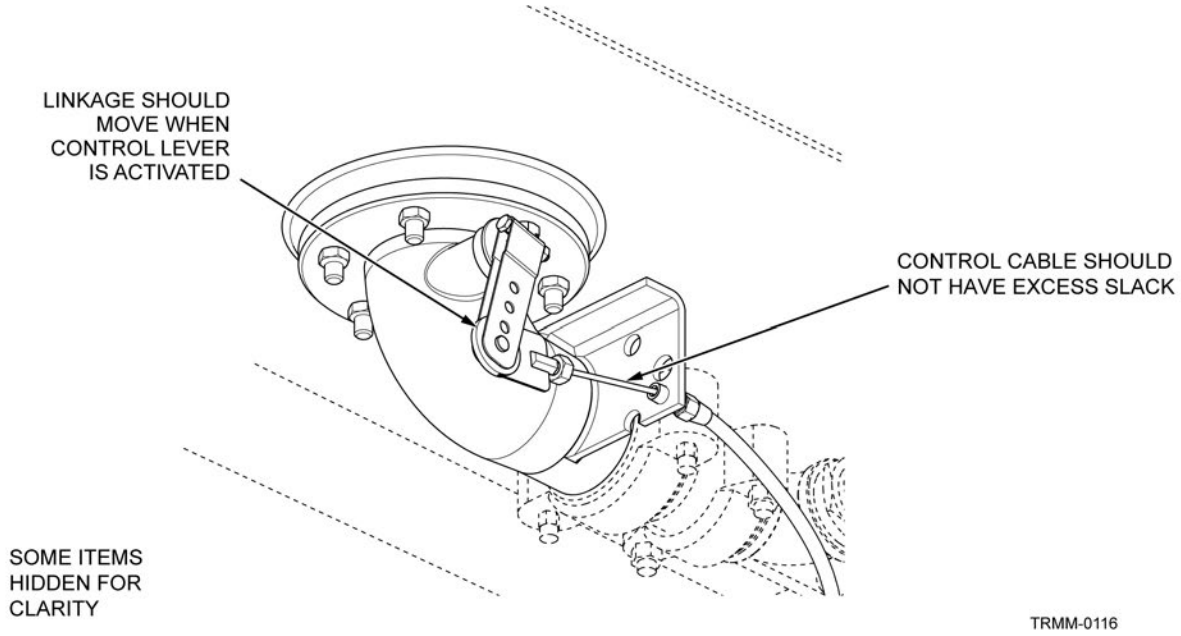

LINKAGE SHOULD MOVE WHEN CONTROL LEVER IS ACTIVATED
CONTROL CABLE SHOULD NOT HAVE EXCESS SLACK
SOME ITEMS HIDDEN FOR CLARITY
TRMM-0116

Figure 4. Tank Discharge Valve (V2) Control Cable.

STEP

6. While observing tank discharge valve (V2) (Figure 3), open and close it using control lever (Figure 5, Item 1).

CONDITION/INDICATION

Does tank discharge valve (V2) control lever (Figure 5, Item 1) move, but tank discharge valve (V2) linkage (Figure 6) does not move?

FUEL NOT FLOWING FROM TANK DURING GRAVITY DISCHARGE OPERATIONS - Continued

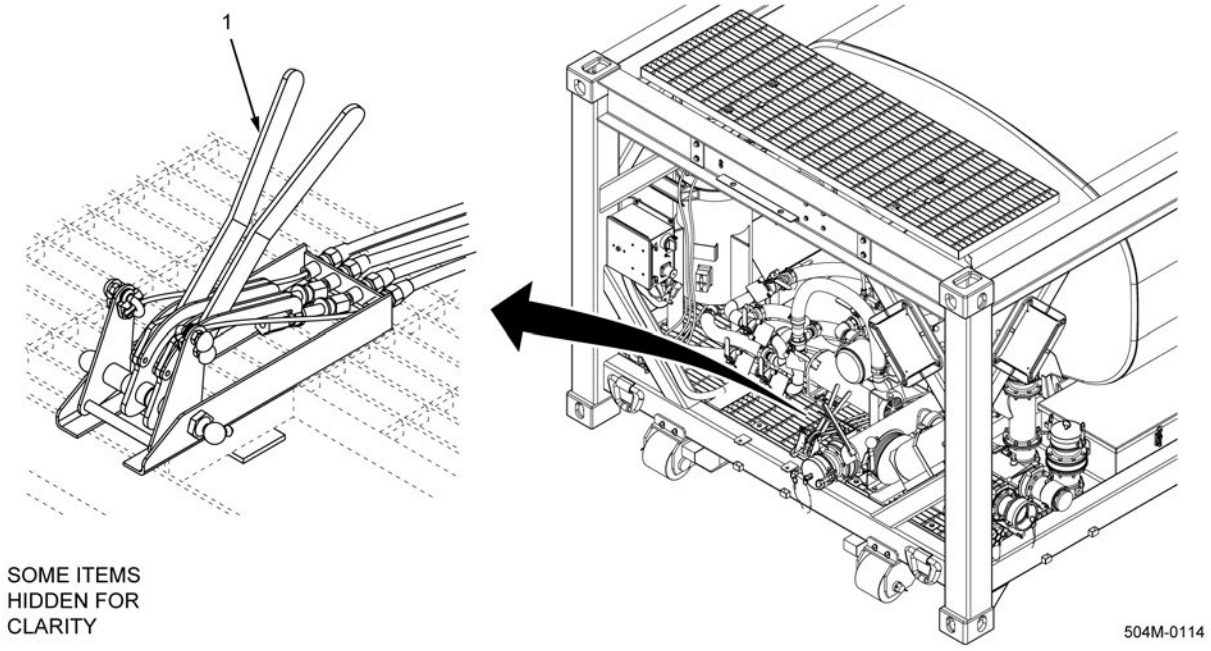


Figure 5. Tank Discharge Valve (V2) Control Lever.

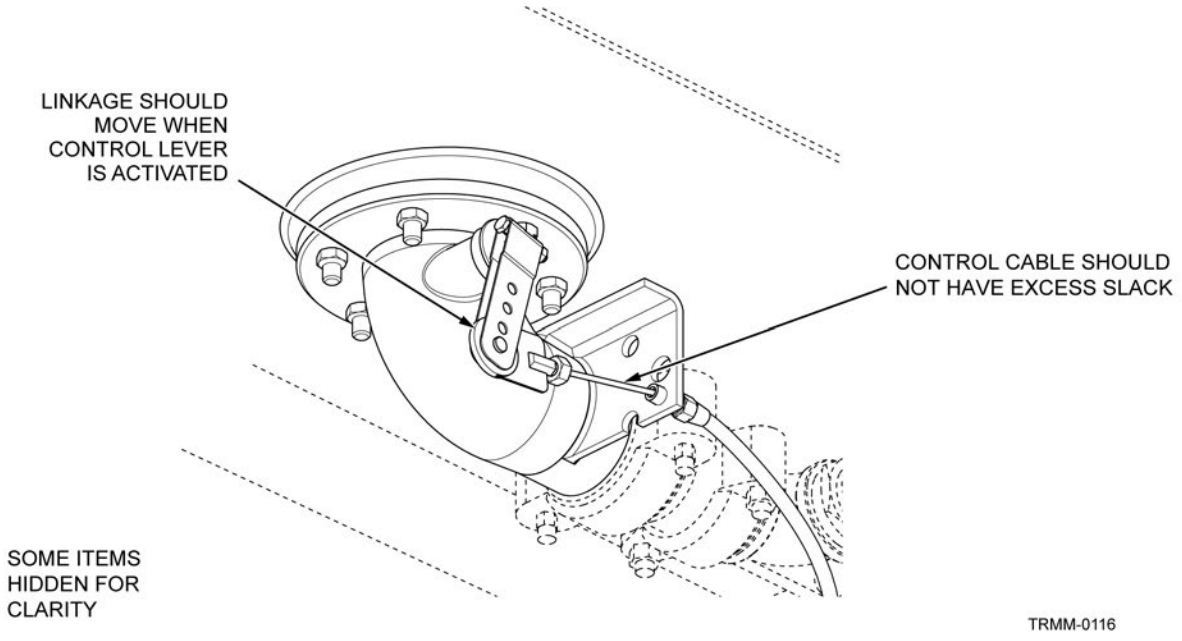


Figure 6. Tank Discharge Valve (V2) Control Cable.

FUEL NOT FLOWING FROM TANK DURING GRAVITY DISCHARGE OPERATIONS - Continued

DECISION

YES - Proceed to Malfunction: Control cable faulty.
NO - Proceed to Malfunction: Tank discharge valve (V2) faulty.

MALFUNCTION

Control cable faulty

ACTION

1. Replace faulty control cable (WP 0075).
2. Verify condition is fixed by performing gravity discharge operation (TM 10-4930-371-10).
3. Continue fueling operations if condition is fixed.

MALFUNCTION

Tank discharge valve (V2) faulty

ACTION

1. Replace tank discharge valve (V2) (WP 0050).
2. Verify condition is fixed by performing gravity discharge operation (TM 10-4930-371-10).
3. Continue fueling operations if condition is fixed.

END OF WORK PACKAGE

MAINTAINER TROUBLESHOOTING
FUEL NOT FLOWING FROM TANK DURING BULK DISCHARGE OPERATIONS TROUBLESHOOTING PROCEDURE

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposible nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)
- Pan, drip (WP 0217, Table 1, Item 8)

Materials/Parts
- Absorbent material (WP 0216, Table 1, Item 1)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer (2)

References
- ATP 4-43

References (cont.)
- TM 10-4930-371-10
- WP 0049
- WP 0073
- WP 0075
- WP 0090
- WP 0091

Equipment Condition
- MFS TRM loaded on PLS trailer (TM 10-4930-371-10)
- MFS TRM grounded (TM 10-4930-371-10)
- MFS TRM ladder platform emplaced (TM 10-4930-371-10)
- MFS TRM ladder emplaced (TM 10-4930-371-10)

Time to Complete
- 1.2 Hour(s)

GENERAL

This work package contains Maintainer troubleshooting procedures for MFS TRM. Use this work package to help isolate and correct system problems. Ensure all operator PMCS and troubleshooting procedures have been performed.

TROUBLESHOOTING PROCEDURE

FUEL NOT FLOWING FROM TANK DURING BULK DISCHARGE OPERATIONS

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Failure to comply could result in injury or death to personnel.

STEP

1. Place drip pan to catch residual fuel under port control valve.
2. Attempt to fully open and close port control valve in use (Figure 1).

CONDITION/INDICATION

Does port control valve (Figure 1) fail to fully open and close?

DECISION

YES - Proceed to Malfunction: Port control valve faulty.
NO - Proceed to Step 3.

MALFUNCTION

Port control valve faulty

ACTION

1. Replace defective port control valve:

   For Port G (V3), refer to (WP 0091).

   For Port B (V4), refer to (WP 0090).
2. Verify condition is fixed by performing bulk discharge operation (TM 10-4930-371-10).
3. Continue fueling operations if condition is fixed.

FUEL NOT FLOWING FROM TANK DURING BULK DISCHARGE OPERATIONS - Continued

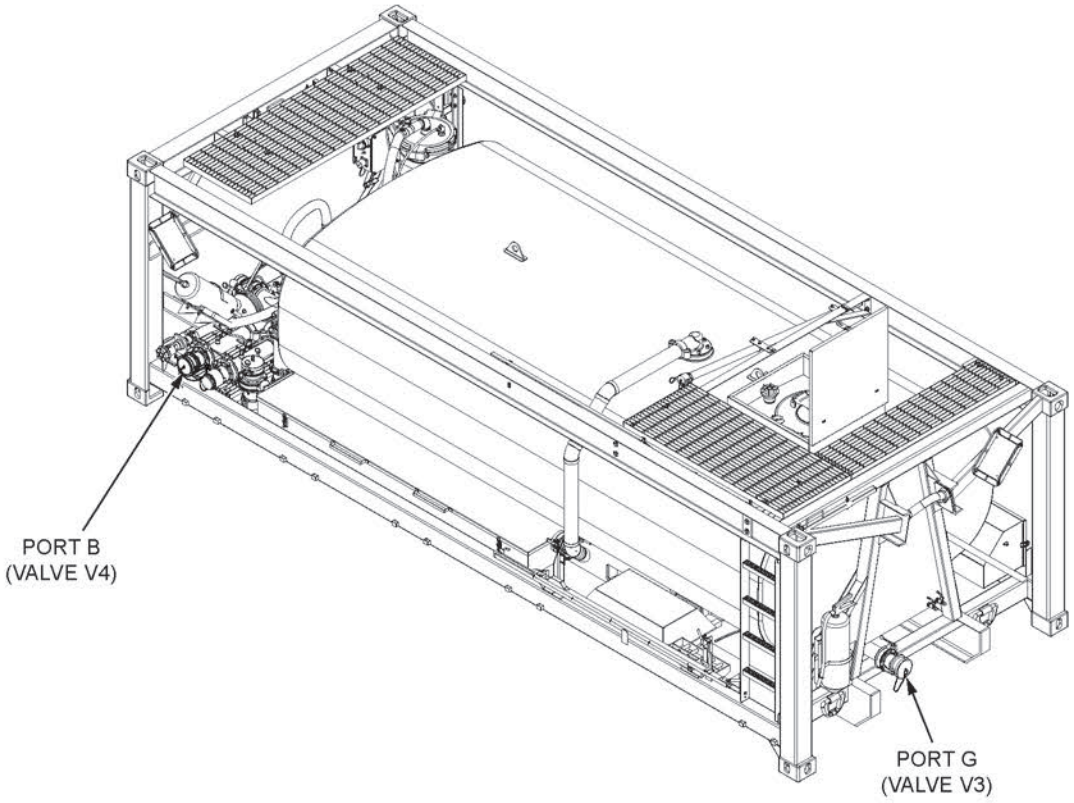


Figure 1. MFS TRM Port Control Valves.

STEP

3. While observing tank discharge valve (V1) (Figure 2), open and close it using control lever (Figure 3, Item 1).

FUEL NOT FLOWING FROM TANK DURING BULK DISCHARGE OPERATIONS - Continued

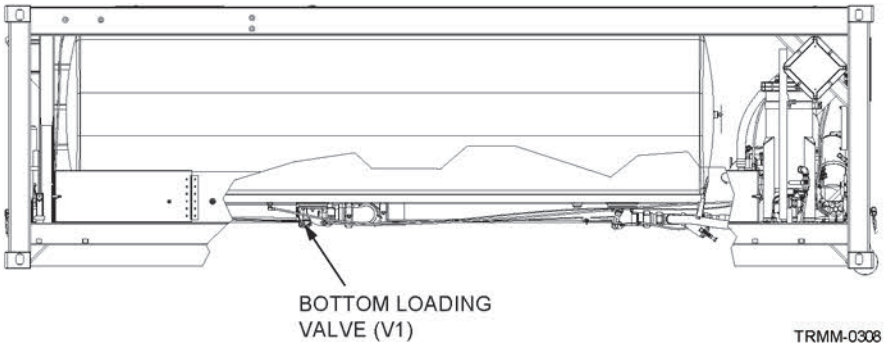


Figure 2. Bottom Loading Valve (V1).

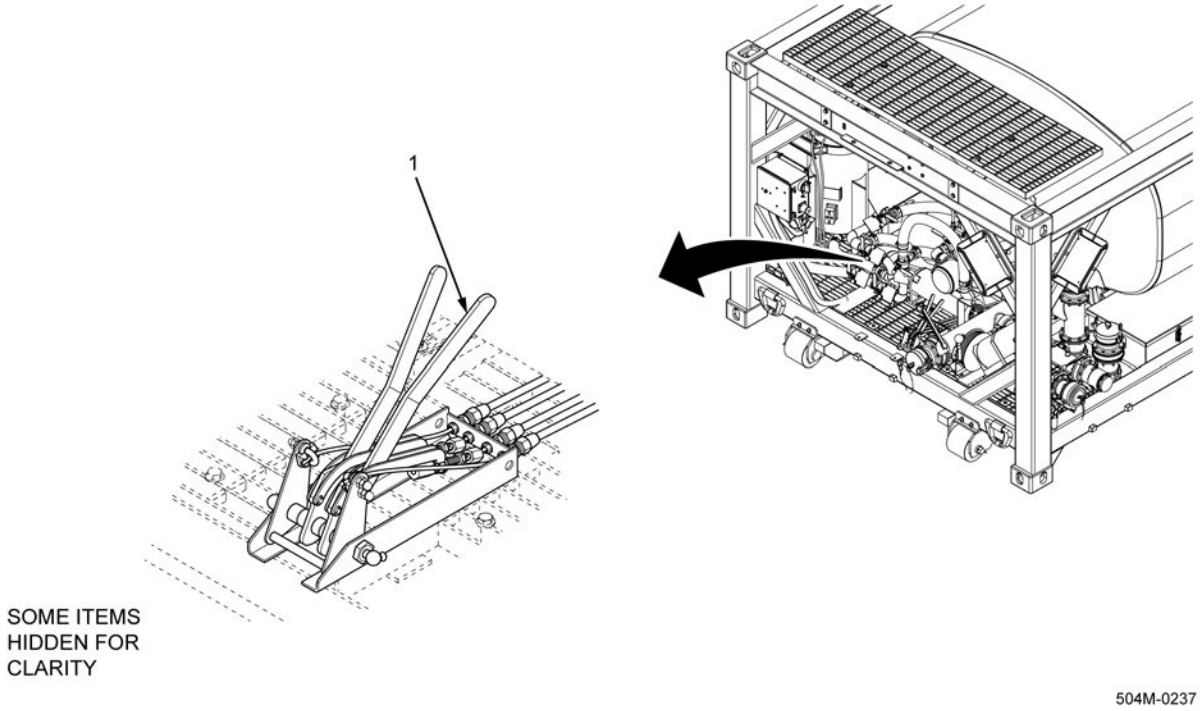


Figure 3. Bottom Loading Valve (V1) Control Lever.

CONDITION/INDICATION

Does control lever have too much slack to operate bottom loading valve (V1) (Figure 4)?

DECISION

YES - Proceed to Malfunction: Control cable out of adjustment.
NO - Proceed to Step 4.

MALFUNCTION

Control cable out of adjustment

FUEL NOT FLOWING FROM TANK DURING BULK DISCHARGE OPERATIONS - Continued

ACTION

1. Adjust bottom loading valve (V1) control cable (WP 0073).
2. Verify condition is fixed by performing bulk discharge operation (TM 10-4930-371-10).
3. Continue fueling operations if condition is fixed.

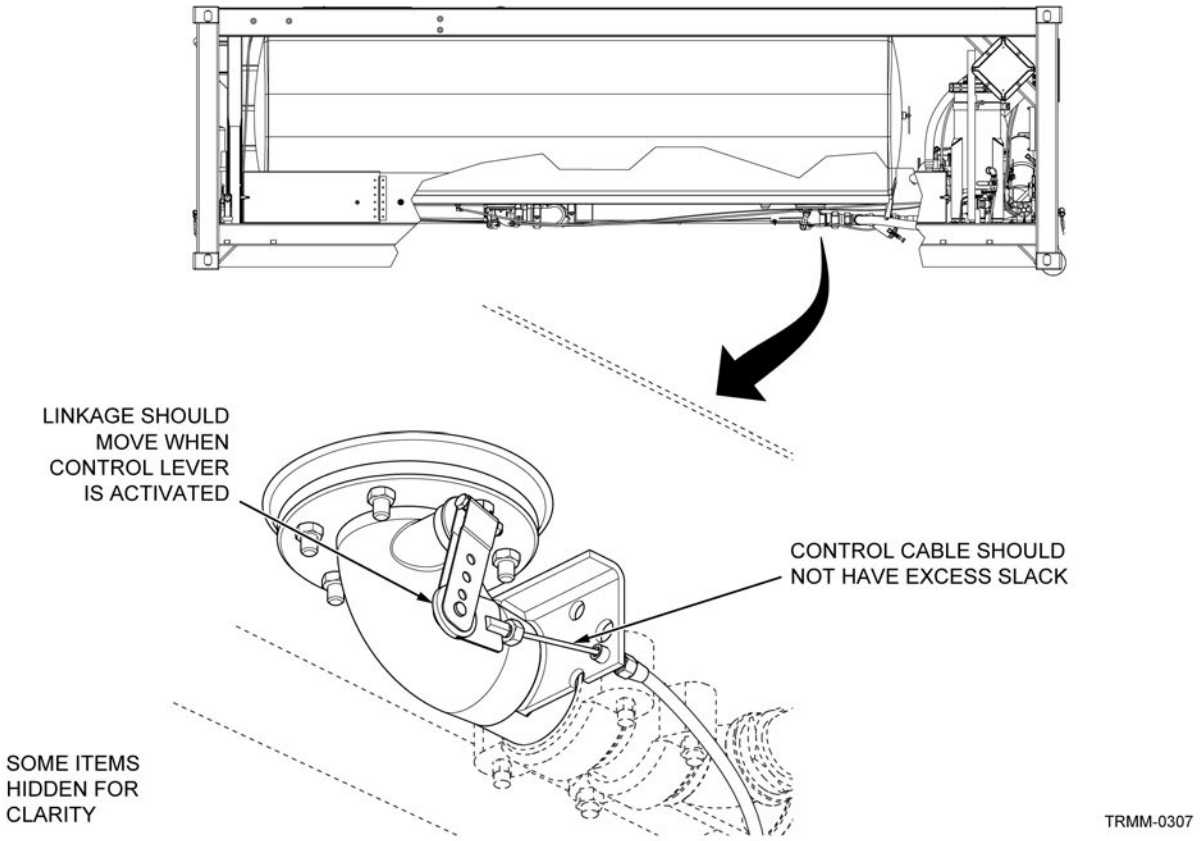

LINKAGE SHOULD MOVE WHEN CONTROL LEVER IS ACTIVATED
CONTROL CABLE SHOULD NOT HAVE EXCESS SLACK
SOME ITEMS HIDDEN FOR CLARITY
TRMM-0307

Figure 4. Bottom Loading Valve (V1).

STEP

4. While observing bottom loading valve (V1) (Figure 4), open and close it using control lever (Figure 5, Item 1).

CONDITION/INDICATION

Does bottom loading valve (V1) control lever (Figure 5, Item 1) move, but linkage (Figure 4) does not move?

FUEL NOT FLOWING FROM TANK DURING BULK DISCHARGE OPERATIONS - Continued

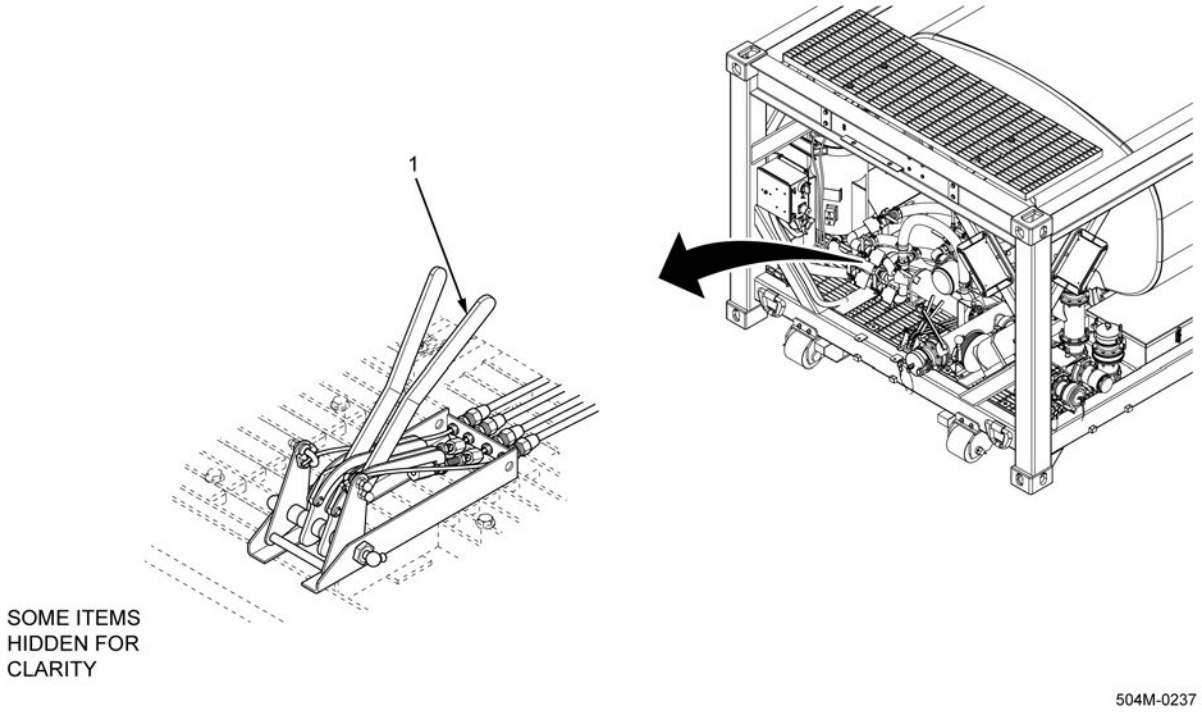


Figure 5. Bottom Loading Valve (V1) Control Lever.

DECISION

YES - Proceed to Malfunction: Control cable faulty.
NO - Proceed to Malfunction: Bottom Loading Valve (V1) faulty.

MALFUNCTION

Control cable faulty

ACTION

1. Replace faulty control cable (WP 0075).
2. Verify condition is fixed by performing bulk discharge operation (TM 10-4930-371-10).
3. Continue fueling operations if condition is fixed.

MALFUNCTION

Bottom Loading Valve (V1) faulty

ACTION

1. Replace bottom loading valve (V1) (WP 0049).
2. Verify condition is fixed by performing bulk discharge operation (TM 10-4930-371-10).
3. Continue fueling operations if condition is fixed.

END OF WORK PACKAGE

MAINTAINER TROUBLESHOOTING
FLOW METER ASSEMBLY DOES NOT REGISTER CORRECTLY TROUBLESHOOTING PROCEDURE

INITIAL SETUP:

Tools and Special Tools
Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
Fire extinguisher (TM 10-4930-371-10)
Gloves, disposible nitrile (WP 0216, Table 1, Item 5)
Goggles, industrial (WP 0216, Table 1, Item 6)

Materials/Parts
Absorbent material (WP 0216, Table 1, Item 1)

Personnel Required
91J Quartermaster and Chemical Equipment Repairer

References
ATP 4-43

References (cont.)
TM 10-4930-371-10
WP 0103

Equipment Condition
MFS TRM prepared for use (TM 10-4930-371-10)
MFS TRM set on level ground (TM 10-4930-371-10)

Time to Complete
0.5 Hour(s)

GENERAL

This work package contains Maintainer troubleshooting procedures for MFS TRM. Use this work package to help isolate and correct system problems. Ensure all operator PMCS and troubleshooting procedures have been performed.

TROUBLESHOOTING PROCEDURE

FLOW METER ASSEMBLY DOES NOT REGISTER CORRECTLY

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Failure to comply could result in injury or death to personnel.

STEP

1. Set flow meter assembly to zero (Figure 1, Item 1).

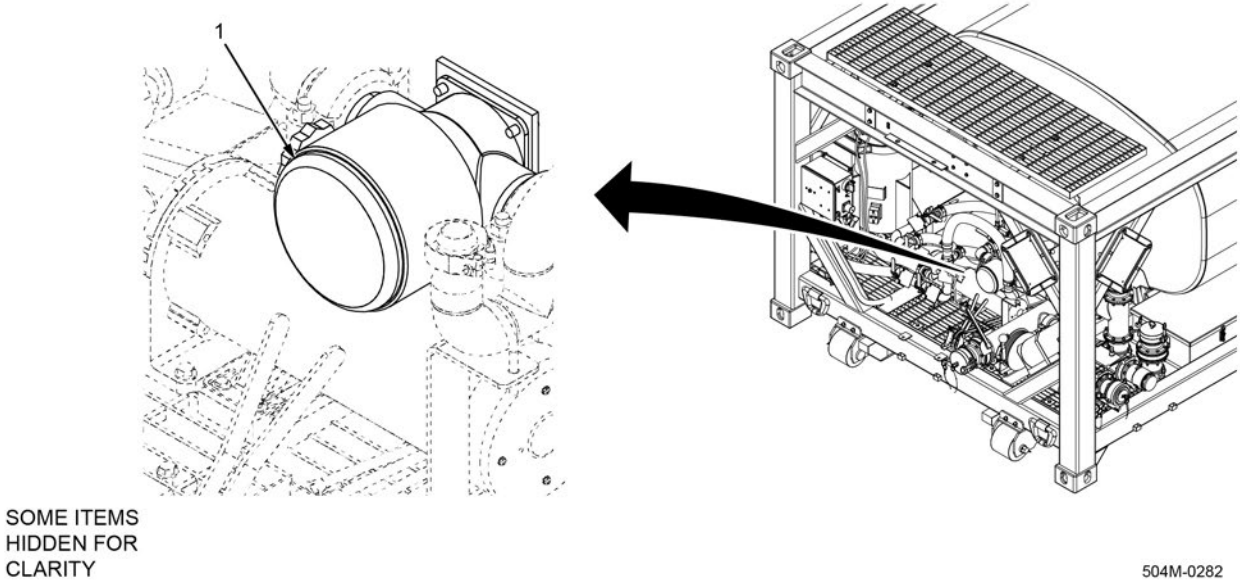


Figure 1. Flow Meter Assembly.

2. Pump fuel flow for one minute and record flow meter assembly reading.

CONDITION/INDICATION

Does flow meter assembly (Figure 1, Item 1) register less than 30 GPM?

FLOW METER ASSEMBLY DOES NOT REGISTER CORRECTLY - Continued

DECISION

YES - Proceed to Malfunction: Flow meter assembly faulty.
NO - Continue fueling operations, and verify the problem is resolved.

MALFUNCTION

Flow meter assembly faulty

ACTION

1. Replace flow meter assembly (Figure 1, Item 1) (WP 0103).
2. Verify condition is fixed by performing recirculation (TM 10-4930-371-10).
3. Continue fueling operations if condition is fixed.

END OF WORK PACKAGE

MAINTAINER TROUBLESHOOTING
FUEL LEAKS FROM MANHOLE ASSEMBLY DURING TRANSPORT TROUBLESHOOTING PROCEDURE

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposible nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)

Materials/Parts
- Absorbent material (WP 0216, Table 1, Item 1)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer

References
- ATP 4-43

References (cont.)
- WP 0053
- WP 0054

Equipment Condition
- MFS TRM loaded with fuel (TM 10-4930-371-10)
- MFS TRM loaded on LHS, PLS, or PLS with trailer (TM 10-4930-371-10)

Time to Complete
- 0.2 Hour(s)

GENERAL

This work package contains Maintainer troubleshooting procedures for MFS TRM. Use this work package to help isolate and correct system problems. Ensure all operator PMCS and troubleshooting procedures have been performed.

TROUBLESHOOTING PROCEDURE

FUEL LEAKS FROM MANHOLE ASSEMBLY DURING TRANSPORT

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Failure to comply could result in injury or death to personnel.

STEP

1. Transport MFS TRM.
2. Bring transportation vehicle to a full stop and shut down transportation vehicle.
3. Check to see if fuel leaked from manhole cover (Figure 1, Item 1) during transport.

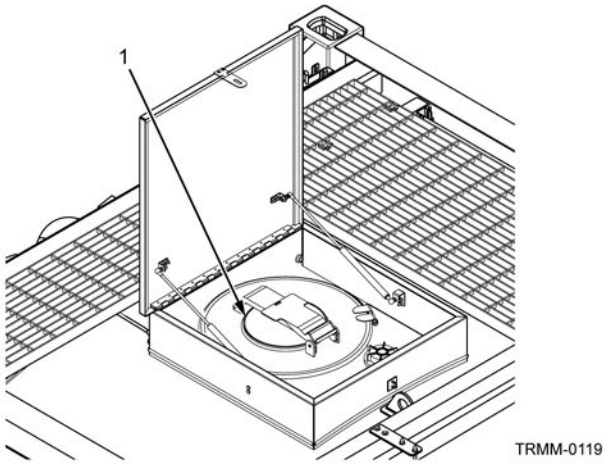


Figure 1. Manhole Cover.

CONDITION/INDICATION

Did fuel leak from manhole cover (Figure 1, Item 1)?

FUEL LEAKS FROM MANHOLE ASSEMBLY DURING TRANSPORT - Continued

DECISION

YES - Proceed to Malfunction: Manhole lid gasket or manhole cover fill plate gasket faulty.
NO - Return MFS TRM to service.

MALFUNCTION

Manhole lid gasket or manhole cover gasket faulty

ACTION

1. Remove manhole cover (WP 0053).
2. Replace manhole cover gasket (WP 0053).
3. Replace manhole cover fill plate gasket (WP 0054).
4. Install manhole cover (WP 0053).

END OF WORK PACKAGE

MAINTAINER TROUBLESHOOTING
BOTTOM LOADING VALVE (V1) LEAKS AT GASKET TROUBLESHOOTING PROCEDURE

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Crow's foot attachment, 3/4" (WP 0217, Table 1, Item 2)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposable nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)
- Wrench, torque, click, ratcheting, 3/8 inch drive, 20 to 100 lb-ft. (WP 0217, Table 1, Item 23)

Materials/Parts
- Absorbent material (WP 0216, Table 1, Item 1)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer

References
- ATP 4-43

References (cont.)
- TM 10-4930-371-10
- WP 0049

Equipment Condition
- MFS TRM grounded (TM 10-4930-371-10)
- MFS TRM mounted on PLS trailer (TM 10-4930-371-10)

Time to Complete
- 1.0 Hour(s)

GENERAL

This work package contains Maintainer troubleshooting procedures for MFS TRM. Use this work package to help isolate and correct system problems. Ensure all operator PMCS and troubleshooting procedures have been performed.

TROUBLESHOOTING PROCEDURE

BOTTOM LOADING VALVE (V1) LEAKS AT GASKET

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Failure to comply could result in injury or death to personnel.

STEP

1. Check to see if fuel is leaking from bottom loading valve (V1) (Figure 1, Item 2).

CONDITION/INDICATION

Is fuel leaking?

DECISION

YES - Proceed to Step 2.
NO - Return MFS TRM to service.

STEP

2. Check to see if any of the six bottom loading valve (V1) mounting nuts (Figure 1, Item 1) are loose.

BOTTOM LOADING VALVE (V1) LEAKS AT GASKET - Continued

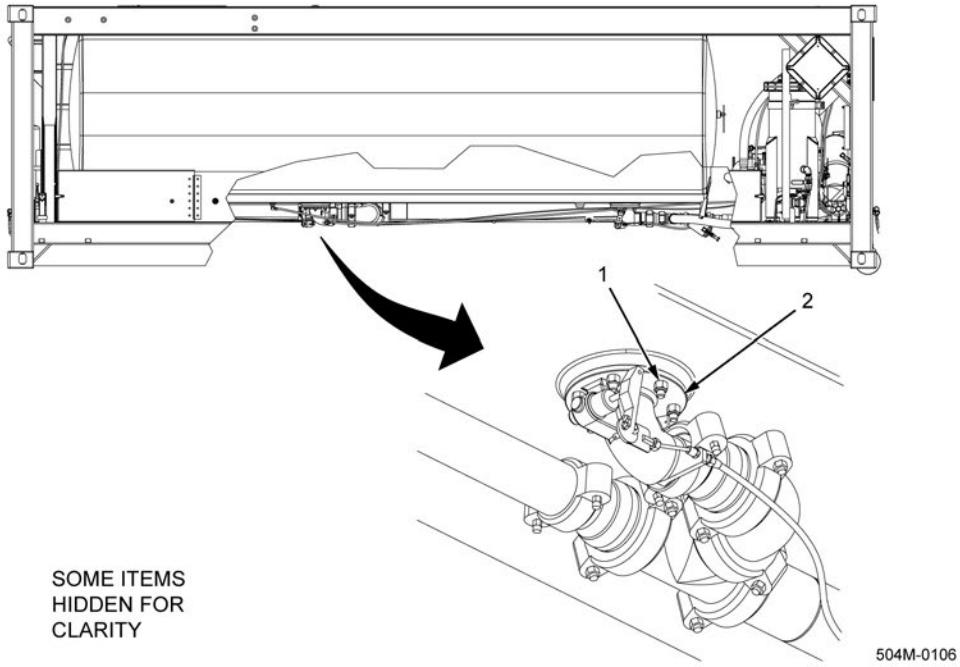


Figure 1. Bottom Loading Valve (V1).

CONDITION/INDICATION

Are any bottom loading valve (V1) mounting nuts (Figure 1, Item 1) loose?

DECISION

YES - Proceed to Malfunction: Bottom loading valve (V1) mounting nuts loose.
NO - Proceed to Malfunction: Bottom loading valve (V1) gasket faulty.

MALFUNCTION

Bottom loading valve (V1) mounting nuts loose

ACTION

1. Tighten bottom loading valve (V1) mounting nuts (Figure 1, Item 1) in standard sequence to 35 ft-lbs as shown in Figure 2.

BOTTOM LOADING VALVE (V1) LEAKS AT GASKET - Continued

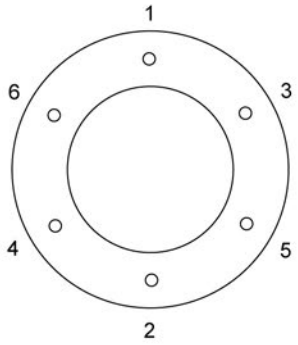


Figure 2. Six-Bolt Torque Sequence.

2. Verify condition is fixed by observing for leaks around bottom loading valve (V1) gasket.
3. If condition still exists, proceed to Malfunction: Bottom loading valve (V1) gasket faulty.
4. Continue fueling operations if condition is fixed.

MALFUNCTION

Bottom loading valve (V1) gasket faulty

ACTION

1. Remove bottom loading valve (V1), replace gasket and install bottom loading valve (V1) (WP 0049).
2. Verify condition is fixed by loading MFS TRM with fuel (TM 10-4930-371-10) and observing for leaks around bottom loading valve (V1) gasket.
3. Continue fueling operations if condition is fixed.

END OF WORK PACKAGE

MAINTAINER TROUBLESHOOTING
TANK DISCHARGE VALVE (V2) LEAKS AT GASKET TROUBLESHOOTING PROCEDURE

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Crow's foot attachment, 3/4" (WP 0217, Table 1, Item 2)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposable nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)
- Wrench, torque, click, ratcheting, 3/8 inch drive, 20 to 100 lb-ft. (WP 0217, Table 1, Item 23)

Materials/Parts
- Absorbent material (WP 0216, Table 1, Item 1)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer

References
- ATP 4-43

References (cont.)
- TM 10-4930-371-10
- WP 0050

Equipment Condition
- MFS TRM grounded (TM 10-4930-371-10)
- MFS TRM mounted on PLS trailer (TM 10-4930-371-10)

Time to Complete
- 1.0 Hour(s)

GENERAL

This work package contains Maintainer troubleshooting procedures for MFS TRM. Use this work package to help isolate and correct system problems. Ensure all operator PMCS and troubleshooting procedures have been performed.

TROUBLESHOOTING PROCEDURE

TANK DISCHARGE VALVE (V2) LEAKS AT GASKET

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Failure to comply could result in injury or death to personnel.

STEP

1. Check to see if fuel is leaking from tank discharge valve (V2) (Figure 1, Item 1).

CONDITION/INDICATION

Is fuel leaking?

DECISION

YES - Proceed to Step 2.
NO - Return MFS TRM to service.

STEP

2. Check to see if any of the six tank discharge valve (V2) mounting nuts (Figure 1, Item 2) are loose.

TANK DISCHARGE VALVE (V2) LEAKS AT GASKET - Continued

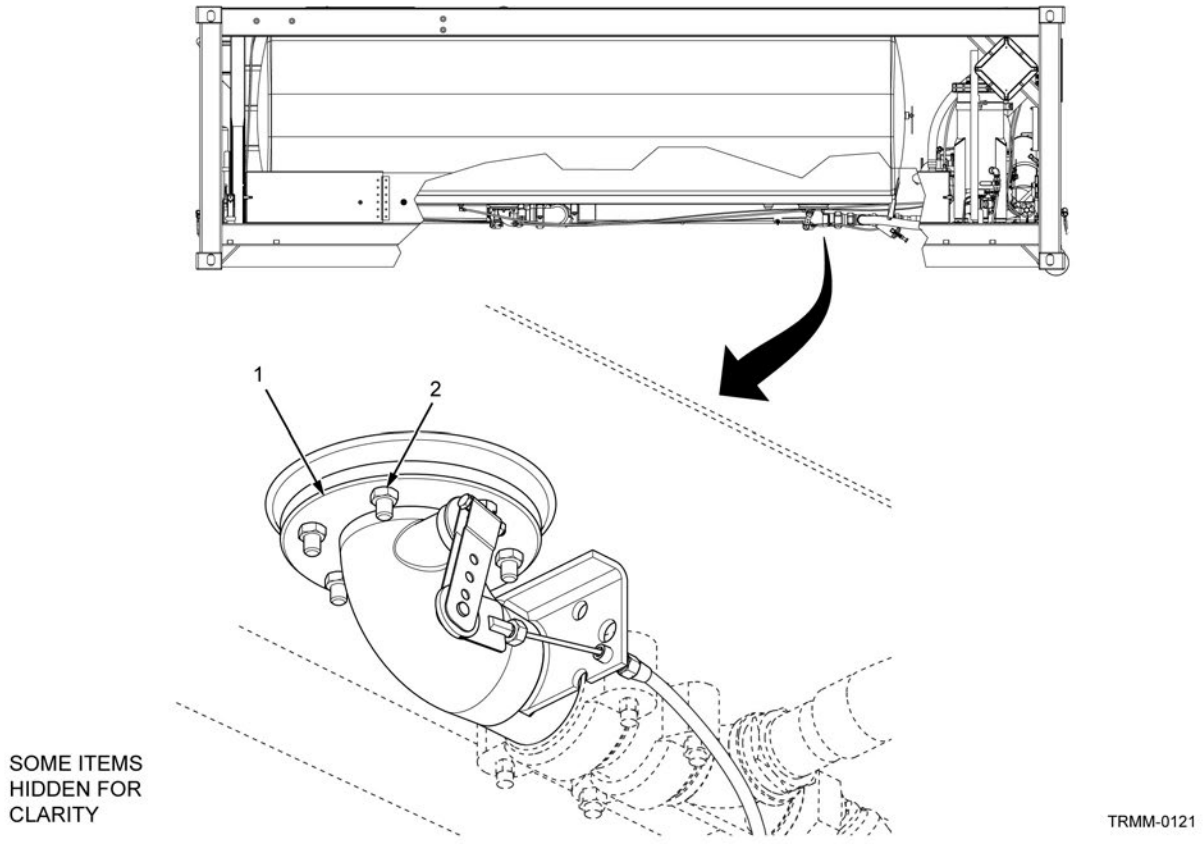


Figure 1. Tank Discharge Valve (V2).

CONDITION/INDICATION

Are any tank discharge valve (V2) mounting nuts (Figure 1, Item 2) loose?

DECISION

YES - Proceed to Malfunction: Tank discharge valve (V2) mounting nuts loose.
NO - Proceed to Malfunction: Tank discharge valve (V2) gasket faulty.

MALFUNCTION

Tank discharge valve (V2) mounting nuts loose

ACTION

1. Tighten tank discharge valve (V2) mounting nuts (Figure 1, Item 2) in standard sequence to 35 ft-lbs as shown in Figure 2.

TANK DISCHARGE VALVE (V2) LEAKS AT GASKET - Continued

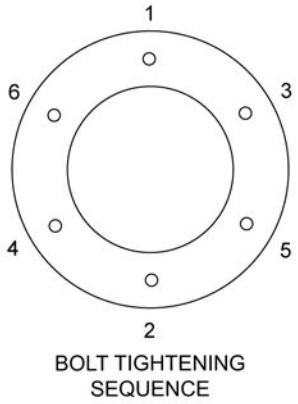


Figure 2. Six-Bolt Torque Sequence.

2. Verify condition is fixed by observing for leaks around tank discharge valve (V2) gasket.
3. If condition still exists, proceed to Malfunction: Tank discharge valve (V2) gasket faulty.
4. Continue fueling operations if condition is fixed.

MALFUNCTION

Tank discharge valve (V2) gasket faulty

ACTION

1. Remove tank discharge valve (V2), replace gasket and install tank discharge valve (V2) (WP 0050).
2. Verify condition is fixed by loading MFS TRM with fuel (TM 10-4930-371-10) and observing for leaks around tank discharge valve (V2) gasket.
3. Continue fueling operations if condition is fixed.

END OF WORK PACKAGE

MAINTAINER TROUBLESHOOTING
FUEL LEAKS FROM STRAINER OR BOTTOM LOADING PIPING ASSEMBLY TROUBLESHOOTING PROCEDURE

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposible nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)

Materials/Parts
- Absorbent material (WP 0216, Table 1, Item 1)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer

References
- ATP 4-43

References (cont.)
- TM 10-4930-371-10
- WP 0049
- WP 0050
- WP 0097
- WP 0098
- WP 0099
- WP 0100
- WP 0102

Equipment Condition
- MFS TRM grounded (TM 10-4930-371-10)
- MFS TRM mounted on PLS trailer (TM 10-4930-371-10)

Time to Complete
- 1.0 Hour(s)

GENERAL

This work package contains Maintainer troubleshooting procedures for MFS TRM. Use this work package to help isolate and correct system problems. Ensure all operator PMCS and troubleshooting procedures have been performed.

TROUBLESHOOTING PROCEDURE

FUEL LEAKS FROM STRAINER OR BOTTOM LOADING PIPING ASSEMBLY

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Failure to comply could result in injury or death to personnel.

STEP

1. Check to see if fuel is leaking from strainer assembly coupling gasket (Figure 1, Item 3), bottom loading valve (V1) coupling gaskets (Figure 1, Item 1), or tank discharge valve (V2) coupling gaskets (Figure 1, Item 2).

FUEL LEAKS FROM STRAINER OR BOTTOM LOADING PIPING ASSEMBLY - Continued

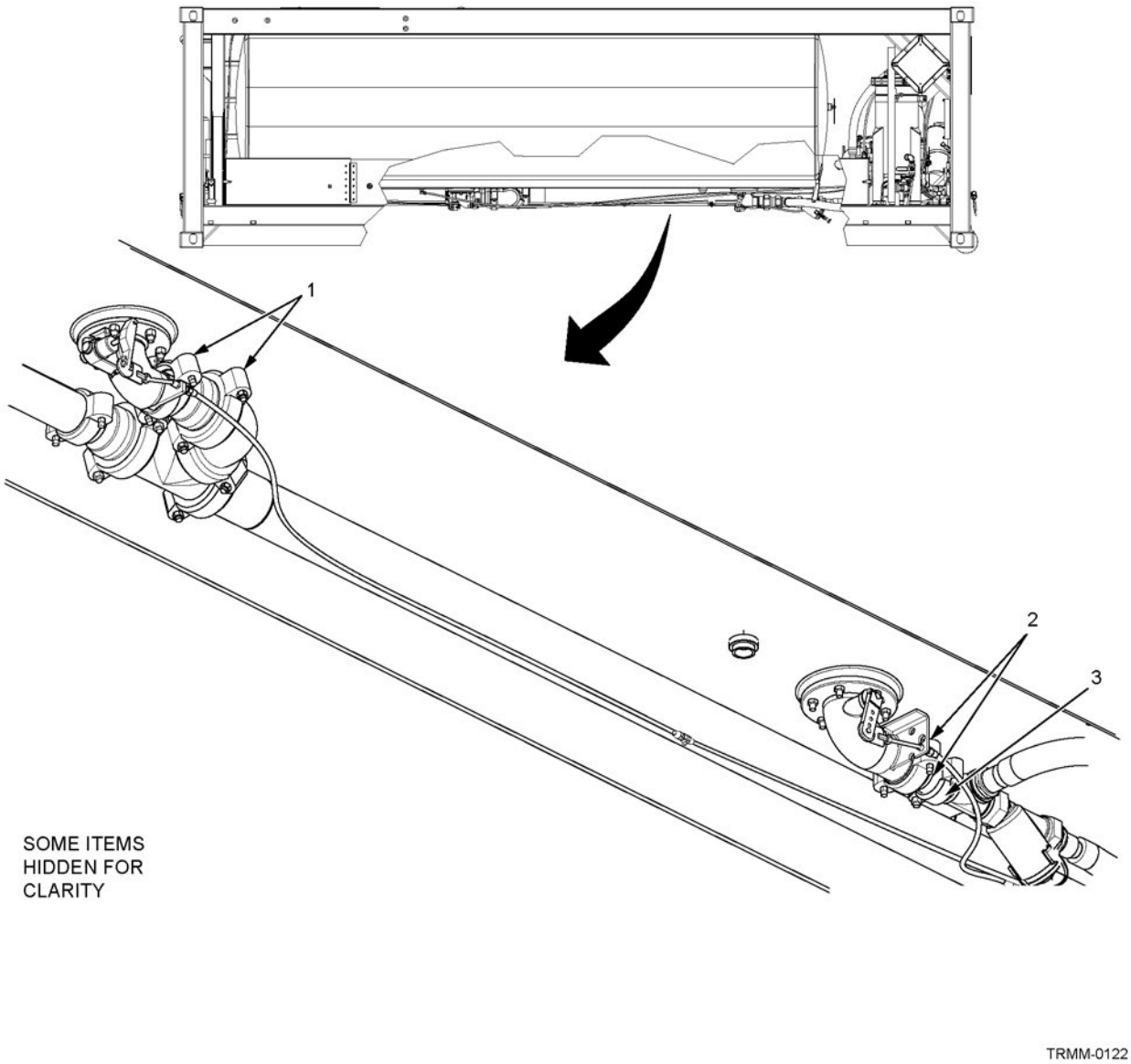


Figure 1. Bottom Loading Valve (V1), Tank Discharge Valve (V2), and Strainer Assembly.

CONDITION/INDICATION

Is fuel leaking?

FUEL LEAKS FROM STRAINER OR BOTTOM LOADING PIPING ASSEMBLY - Continued

DECISION

YES - Proceed to Malfunction: Coupling gasket faulty.
NO - Proceed to Step 2.

MALFUNCTION

Coupling gasket faulty

ACTION

1. Refer to appropriate work package, remove component, and replace coupling gasket(s):

   For strainer assembly coupling gaskets (Figure 1, Item 3), refer to (WP 0102)

   For bottom loading valve (V1) coupling gaskets (Figure 1, Item 1), refer to (WP 0049)

   For tank discharge valve (V2) coupling gaskets (Figure 1, Item 2), refer to (WP 0050)

2. Verify condition is fixed by loading MFS TRM with fuel (TM 10-4930-371-10) and observing for leaks around coupling halves.
3. Continue fueling operations if condition is fixed.

STEP

2. Check to see if fuel is leaking from front bottom piping (Figure 2, Item 3), rear bottom piping (Figure 2, Item 4), bottom piping elbow (Figure 2, Item 1), or bottom piping tee (Figure 2, Item 2).

FUEL LEAKS FROM STRAINER OR BOTTOM LOADING PIPING ASSEMBLY - Continued

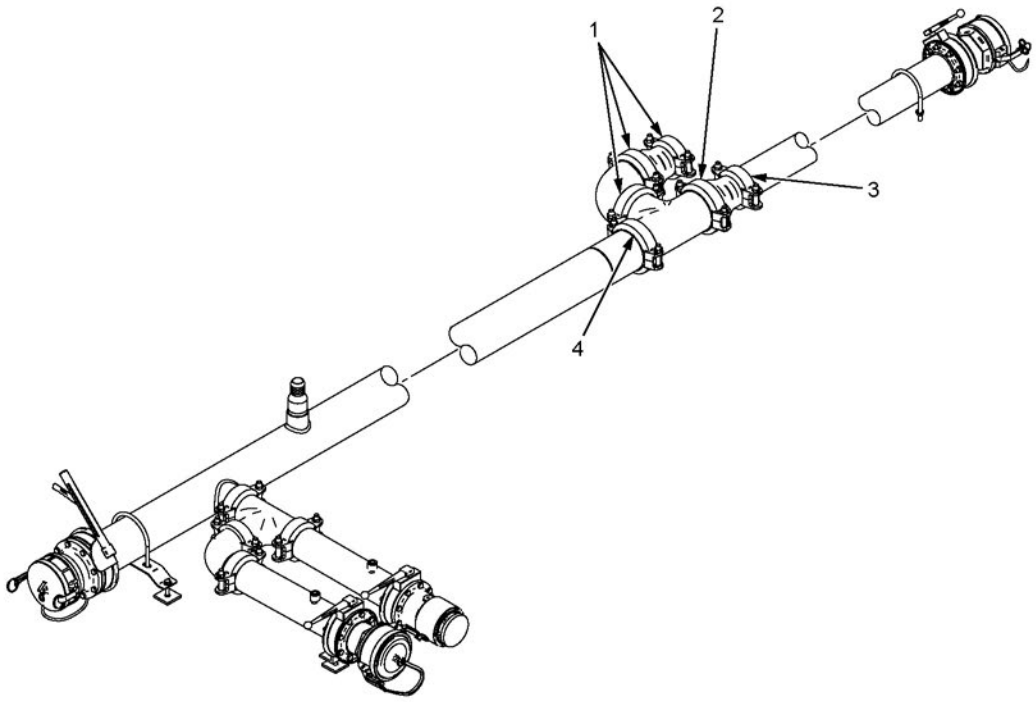


Figure 2. Bottom Piping Assembly.

CONDITION/INDICATION

Is fuel leaking?

FUEL LEAKS FROM STRAINER OR BOTTOM LOADING PIPING ASSEMBLY - Continued

DECISION

YES - Proceed to Malfunction: Coupling gasket faulty.
NO - Return MFS TRM to service.

MALFUNCTION

Coupling gasket faulty

ACTION

1. Refer to appropriate work package, remove component, and replace coupling gasket(s):

   For front bottom piping (Figure 1, Item 3), refer to (WP 0098)

   For rear bottom piping (Figure 1, Item 4), refer to (WP 0100)

   For bottom piping elbow (Figure 1, Item 1), refer to (WP 0097)

   For bottom piping tee (Figure 1, Item 2), refer to (WP 0099)

2. Verify condition is fixed by loading MFS TRM with fuel (TM 10-4930-371-10) and observing for leaks around coupling halves.
3. Continue fueling operations if condition is fixed.

END OF WORK PACKAGE

MAINTAINER TROUBLESHOOTING
FUEL LEAKS FROM PORT CONTROL VALVE (V3, V4, V5, V6, V7, OR V8) TROUBLESHOOTING PROCEDURE

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposible nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)

Materials/Parts
- Absorbent material (WP 0216, Table 1, Item 1)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer

References
- ATP 4-43
- TM 10-4930-371-10
- WP 0090
- WP 0091
- WP 0092
- WP 0093
- WP 0095

Equipment Condition
- MFS TRM grounded (TM 10-4930-371-10)
- MFS TRM shut down (TM 10-4930-371-10)

Time to Complete
- 0.5 Hour(s)

GENERAL

This work package contains Maintainer troubleshooting procedures for MFS TRM. Use this work package to help isolate and correct system problems. Ensure all operator PMCS and troubleshooting procedures have been performed.

TROUBLESHOOTING PROCEDURE

FUEL LEAKS FROM PORT CONTROL VALVE (V3, V4, V5, V6, V7, OR V8)

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Failure to comply could result in injury or death to personnel.

STEP

1. Check to see if fuel is leaking from port control valve (V3, V4, V5, V6, V7, or V8) (Figure 1).

FUEL LEAKS FROM PORT CONTROL VALVE (V3, V4, V5, V6, V7, OR V8) - Continued

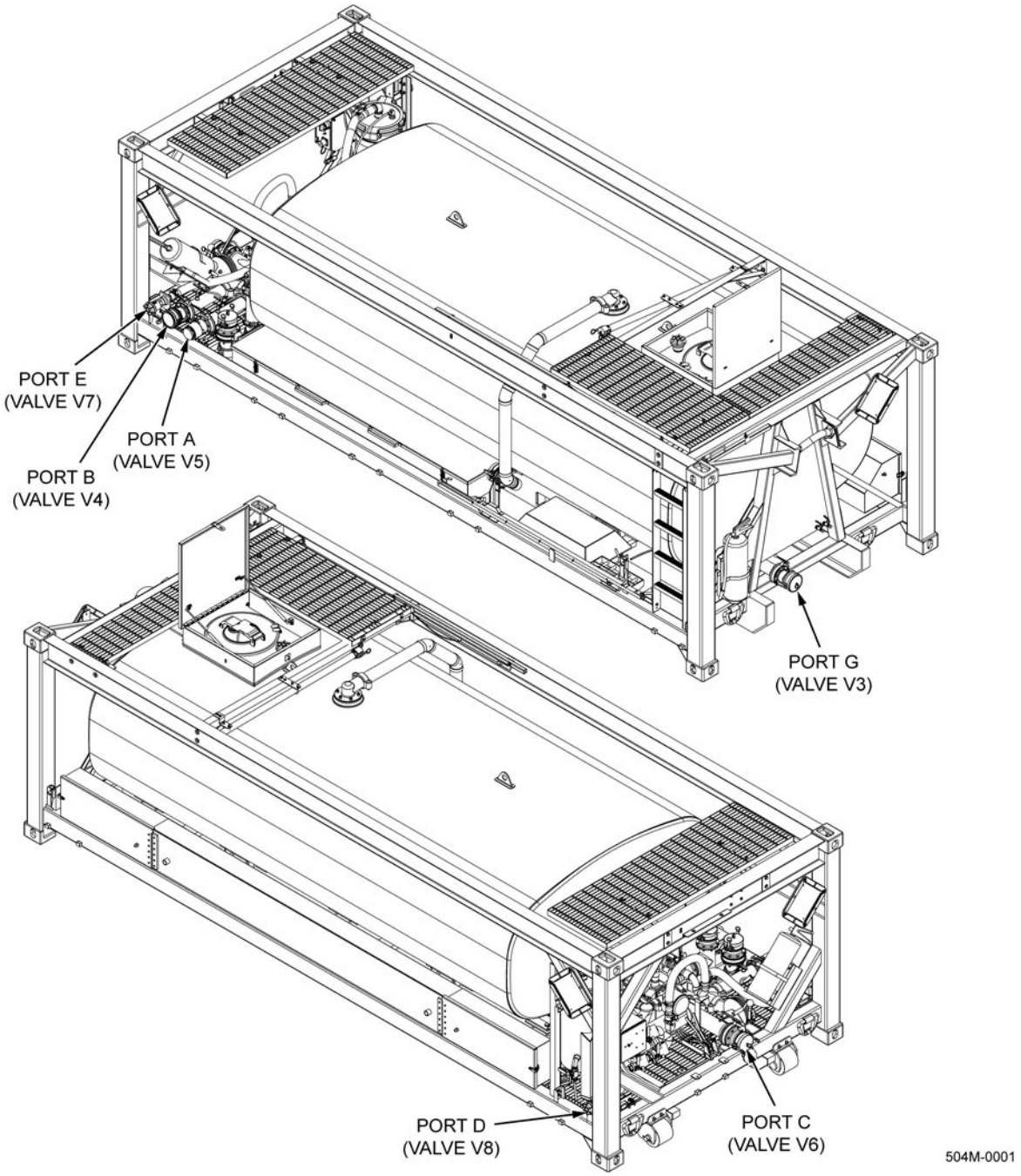


Figure 1. MFS TRM Port Control Valves.

CONDITION/INDICATION

Is fuel leaking?

FUEL LEAKS FROM PORT CONTROL VALVE (V3, V4, V5, V6, V7, OR V8) - Continued

DECISION

YES - Proceed to Malfunction: Port control valve or gasket faulty.
NO - Return MFS TRM to service.

MALFUNCTION

Port control valve gasket faulty

ACTION

1. Refer to appropriate work package, remove component, and replace port control valve and valve gasket(s):
   (V4) (Port B) (WP 0090)
   (V5) (Port A) (WP 0092)
   (V6) (Port C) (WP 0093)
2. Verify condition is fixed by loading fuel into MFS TRM and performing pumping operations using the affected port control valve (TM 10-4930-371-10) and observing for leaks.
3. Continue fueling operations if condition is fixed.

MALFUNCTION

Port control valve or seal faulty

ACTION

1. Refer to appropriate work package, remove component, and replace port control valve or seal(s):
   (V3) (Port G) (WP 0091)
   (V7) (Ports E) or (V8) (Port D) (WP 0095).
2. Verify condition is fixed by loading fuel into MFS TRM and performing pumping operations using the affected port control valve (TM 10-4930-371-10) and observing for leaks.
3. Continue fueling operations if condition is fixed.

END OF WORK PACKAGE

MAINTAINER TROUBLESHOOTING
FUEL LEAKS FROM RIGHT SIDE PIPING MANIFOLD ASSEMBLY TROUBLESHOOTING PROCEDURE

INITIAL SETUP:

Tools and Special Tools
Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
Fire extinguisher (TM 10-4930-371-10)
Gloves, disposible nitrile (WP 0216, Table 1, Item 5)
Goggles, industrial (WP 0216, Table 1, Item 6)

Materials/Parts
Absorbent material (WP 0216, Table 1, Item 1)

Personnel Required
91J Quartermaster and Chemical Equipment Repairer

References
ATP 4-43

References (cont.)
TM 10-4930-371-10
WP 0096

Equipment Condition
MFS TRM grounded (TM 10-4930-371-10)
MFS TRM shut down (TM 10-4930-371-10)

Time to Complete
0.5 Hour(s)

GENERAL

This work package contains Maintainer troubleshooting procedures for MFS TRM. Use this work package to help isolate and correct system problems. Ensure all operator PMCS and troubleshooting procedures have been performed.

TROUBLESHOOTING PROCEDURE

FUEL LEAKS FROM RIGHT SIDE PIPING MANIFOLD ASSEMBLY

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Failure to comply could result in injury or death to personnel.

STEP

NOTE

It may be necessary to perform fueling operations (TM 10-4930-371-10) to locate and verify leaks.

1. Check to see if fuel is leaking from coupling halves (Figure 1, Items 1, 2, 3 or 4) on right side piping manifold assembly.

FUEL LEAKS FROM RIGHT SIDE PIPING MANIFOLD ASSEMBLY - Continued

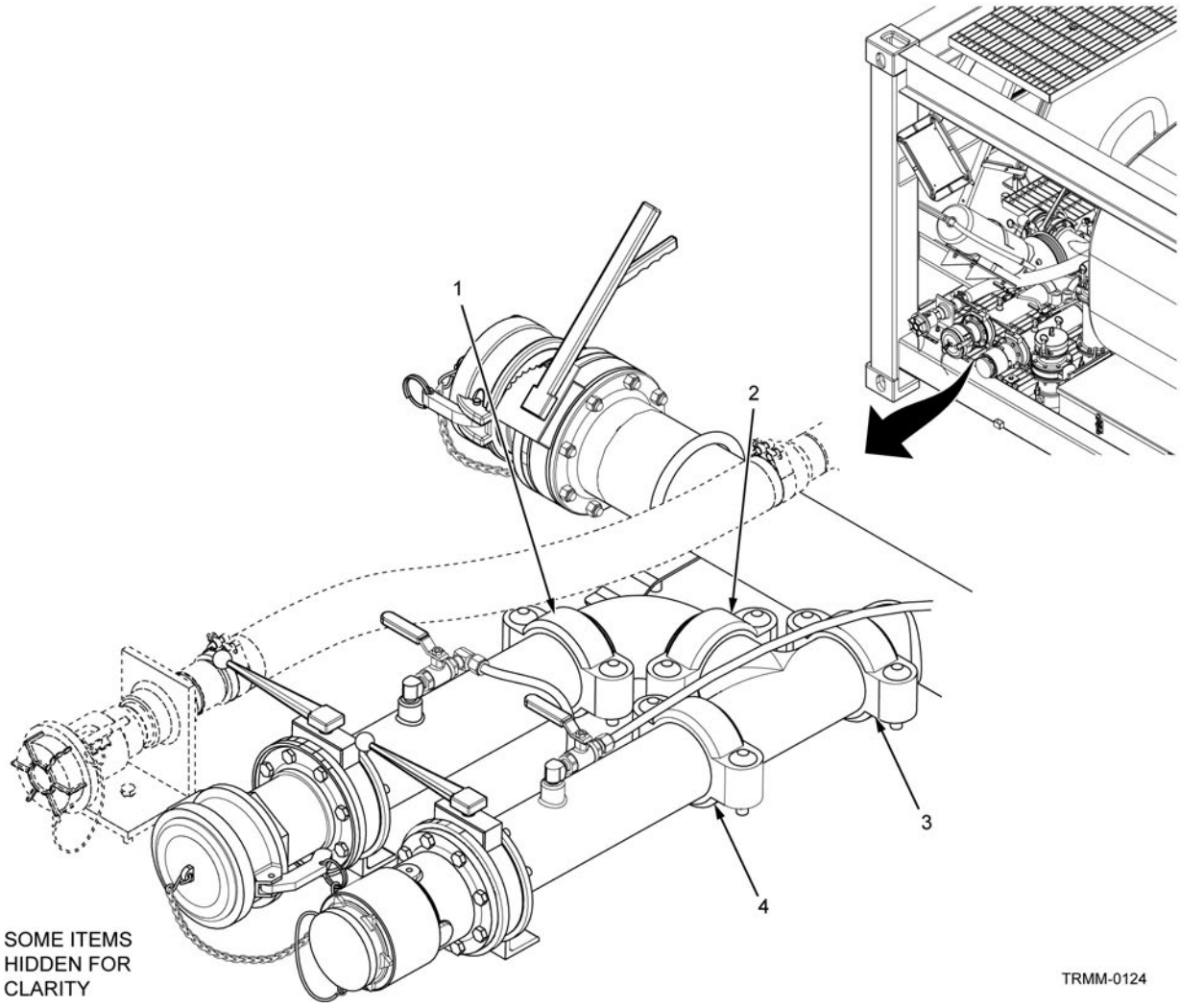


Figure 1. Right Side Piping Assembly.

CONDITION/INDICATION

Is fuel leaking?

DECISION

YES - Proceed to Malfunction: Coupling gasket faulty.
NO - Return MFS TRM to service.

MALFUNCTION

Coupling gasket faulty

ACTION

1. Refer to (WP 0096), remove component(s) associated with leak, and replace coupling gasket(s):

FUEL LEAKS FROM RIGHT SIDE PIPING MANIFOLD ASSEMBLY - Continued

2. Verify condition is fixed by loading MFS TRM with fuel (TM 10-4930-371-10) and observing for leaks around coupling halves.
3. Continue fueling operations if condition is fixed.

END OF WORK PACKAGE

MAINTAINER TROUBLESHOOTING
FUEL LEAKS FROM BALL VALVE ASSEMBLY (V9, V10, V11, V12, V13, V14, V15, V21, OR V22)
TROUBLESHOOTING PROCEDURE

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposible nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)

Materials/Parts
- Absorbent material (WP 0216, Table 1, Item 1)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer

References
- ATP 4-43

References (cont.)
- TM 10-4930-371-10
- WP 0085
- WP 0086
- WP 0087
- WP 0088
- WP 0106
- WP 0107
- WP 0144.1
- WP 0144.5

Equipment Condition
- MFS TRM prepared for use (TM 10-4930-371-10)

Time to Complete
- 0.5 Hour(s)

GENERAL

This work package contains Maintainer troubleshooting procedures for MFS TRM. Use this work package to help isolate and correct system problems. Ensure all operator PMCS and troubleshooting procedures have been performed.

TROUBLESHOOTING PROCEDURE

FUEL LEAKS FROM BALL VALVE ASSEMBLY (V9, V10, V11, V12, V13, V14, V15, V21, OR V22)

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Failure to comply could result in injury or death to personnel.

STEP

NOTE

It may be necessary to perform fueling operations (TM 10-4930-371-10) to locate and verify leaks.

1. Inspect MFS TRM to verify and locate leaking ball valve assembly.

CONDITION/INDICATION

Is fuel leaking?

DECISION

YES - Proceed to Malfunction: Ball valve or hose faulty.
NO - Return MFS TRM to service.

MALFUNCTION

Ball valve or hose faulty

ACTION

1. Refer to appropriate work package, remove component, and replace faulty ball valve and/or hose:

   (V9) (Figure 1) (WP 0085)

   (V10) (Figure 1) or (V11) (Figure 1) (WP 0086)

   (V12) (Figure 1) (WP 0087)

   for (V13) (Figure 1) (WP 0106)

   for (V14) (Figure 1)(WP 0107)

   for (V15) (Figure 1) (WP 0088)

FUEL LEAKS FROM BALL VALVE ASSEMBLY (V9, V10, V11, V12, V13, V14, V15, V21, OR V22) - Continued

for (V14) meter outlet valve (TRM with ADR) (Figure 2) (WP 0144.5)
for (V21) secondary manual shutoff valve (TRM with ADR) (Figure 2) (WP 0144.1)
for (V22) secondary manual shutoff valve (TRM with ADR) (Figure 2) (WP 0144.1).

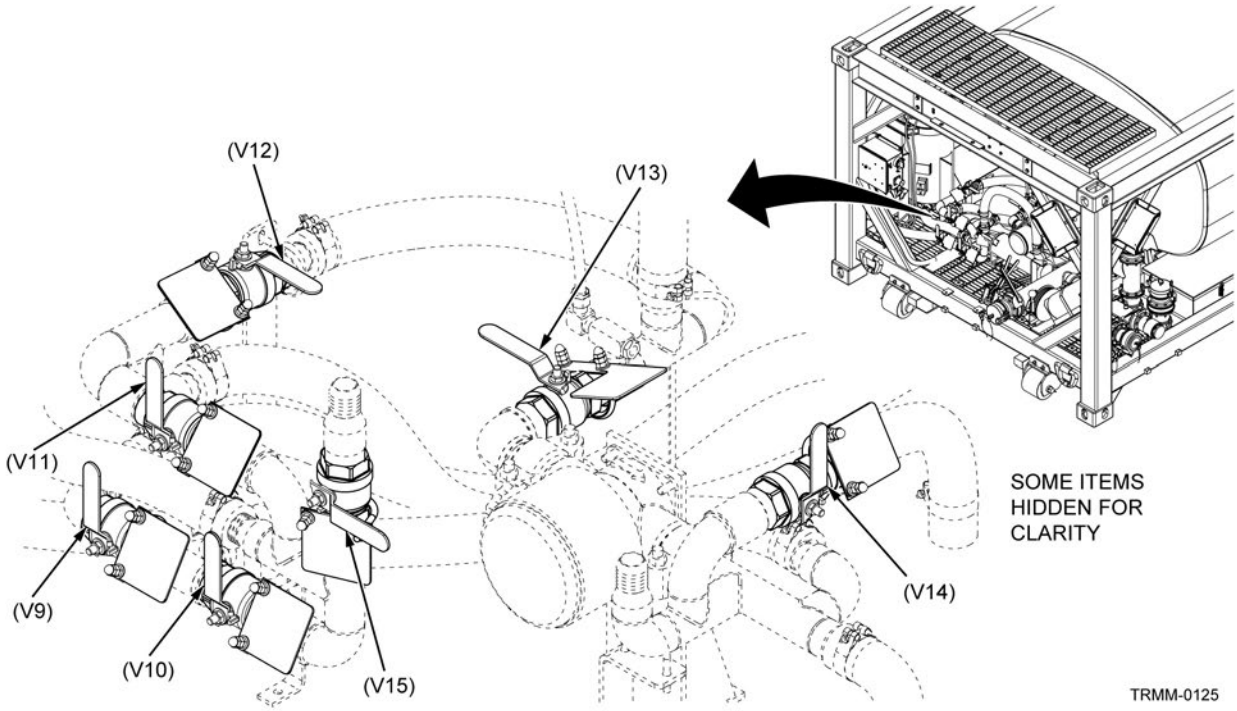


Figure 1. TRM Without ADR Ball Valve Assemblies.

FUEL LEAKS FROM BALL VALVE ASSEMBLY (V9, V10, V11, V12, V13, V14, V15, V21, OR V22) - Continued

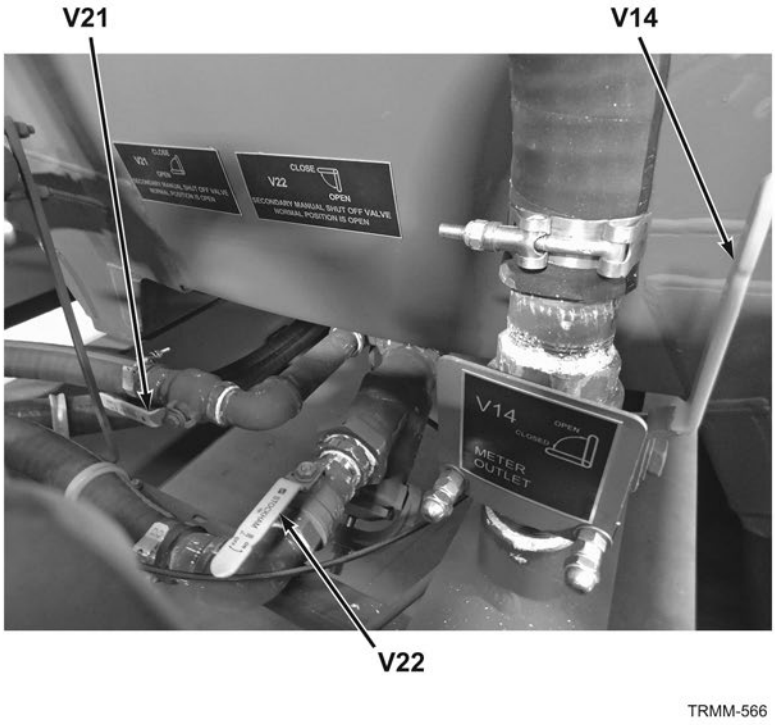


Figure 2. TRM With ADR Ball Valve Assemblies.

2. Verify condition is fixed by loading fuel into MFS TRM and performing pumping operations using the affected ball valve (TM 10-4930-371-10) and observing for leaks.
3. Continue fueling operations if condition is fixed.

END OF WORK PACKAGE

MAINTAINER TROUBLESHOOTING
FUEL LEAKS FROM FLOW METER ASSEMBLY TROUBLESHOOTING PROCEDURE

INITIAL SETUP:

Tools and Special Tools
Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
Fire extinguisher (TM 10-4930-371-10)
Gloves, disposible nitrile (WP 0216, Table 1, Item 5)
Goggles, industrial (WP 0216, Table 1, Item 6)

Materials/Parts
Absorbent material (WP 0216, Table 1, Item 1)

Personnel Required
91J Quartermaster and Chemical Equipment Repairer

References
ATP 4-43

References (cont.)
TM 10-4930-371-10
WP 0103
WP 0105

Equipment Condition
MFS TRM grounded (TM 10-4930-371-10)
MFS TRM shut down (TM 10-4930-371-10)

Time to Complete
0.5 Hour(s)

GENERAL

This work package contains Maintainer troubleshooting procedures for MFS TRM. Use this work package to help isolate and correct system problems. Ensure all operator PMCS and troubleshooting procedures have been performed.

TROUBLESHOOTING PROCEDURE

FUEL LEAKS FROM FLOW METER ASSEMBLY

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Failure to comply could result in injury or death to personnel.

STEP

1. Check for leaks from flow meter assembly coupling gaskets (Figure 1, Items 1 and 2).

FUEL LEAKS FROM FLOW METER ASSEMBLY - Continued

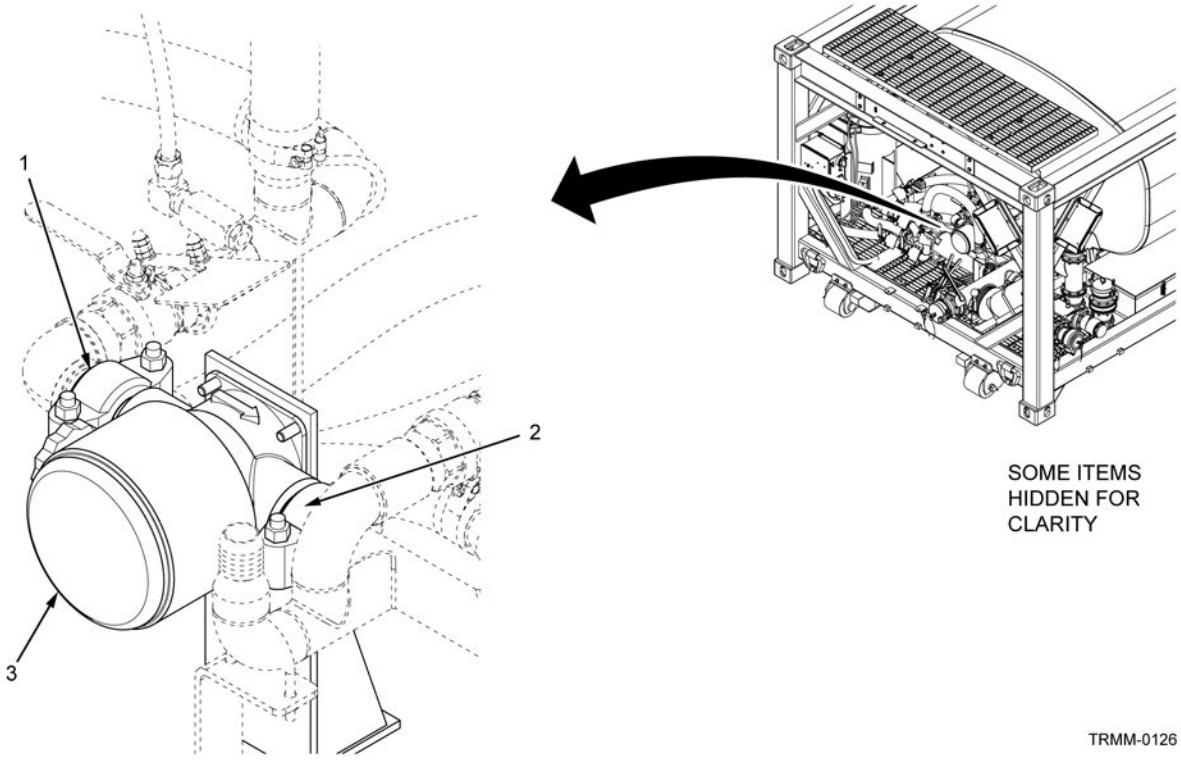


Figure 1. Flow Meter Assembly.

CONDITION/INDICATION

Is fuel leaking from coupling gaskets (Figure 1, Items 1 and 2) on either side of flow meter assembly (Figure 1, Item 3)?

DECISION

YES - Proceed to Malfunction: Coupling gasket(s) faulty.
NO - Proceed to Step 2.

MALFUNCTION

Coupling gasket(s) faulty

ACTION

1. Remove flow meter assembly and replace coupling gaskets (WP 0103).
2. Install flow meter assembly (WP 0103).
3. Verify condition is fixed by placing MFS TRM in recirculation mode (TM 10-4930-371-10) and observing for leaks.
4. Continue fueling operations if condition is fixed.

STEP

2. Check for leaks from flow meter assembly inlet piping (Figure 2, Item 1) or outlet piping (Figure 2, Item 2).

FUEL LEAKS FROM FLOW METER ASSEMBLY - Continued

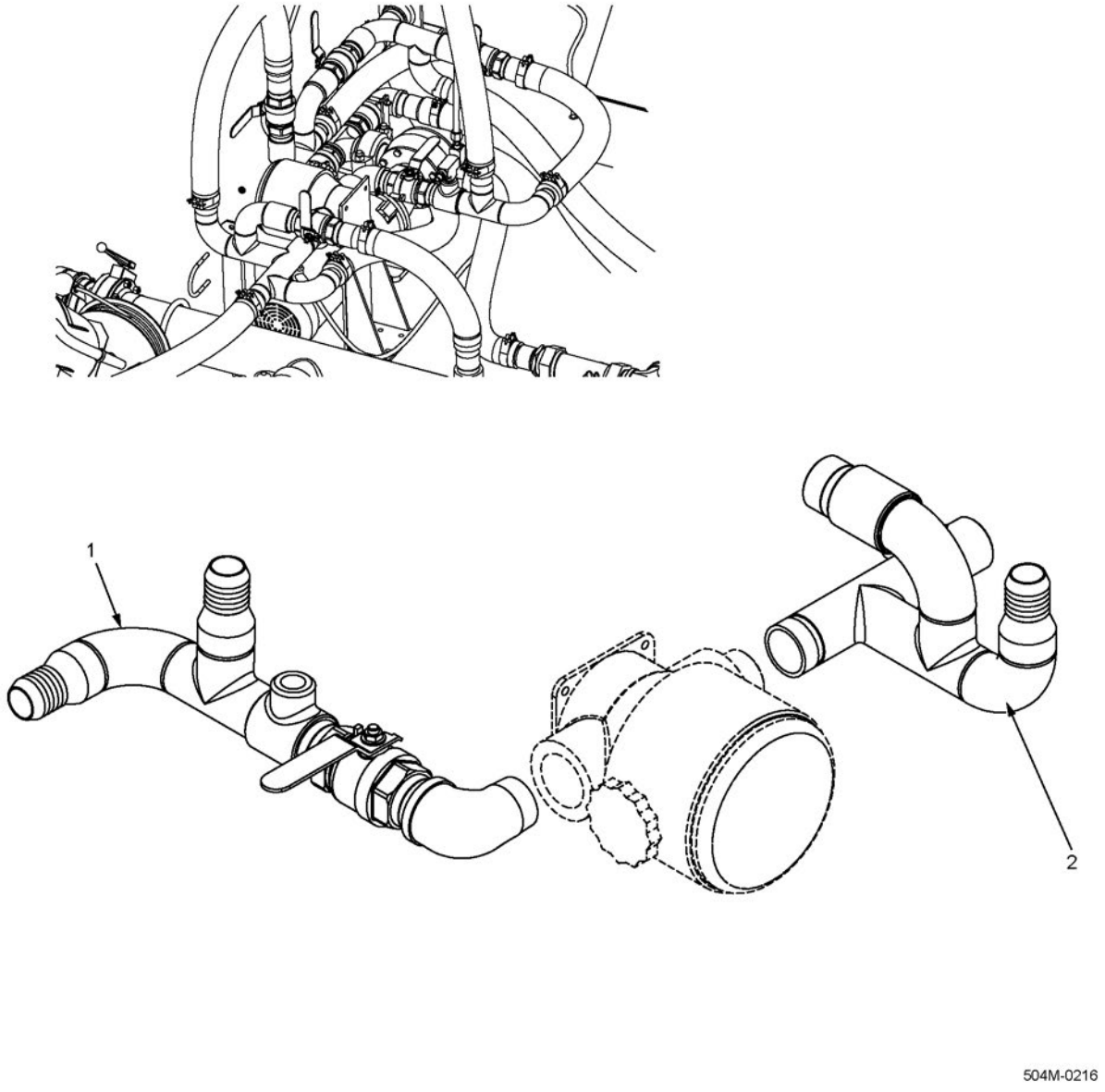


Figure 2. Flow Meter Piping.

CONDITION/INDICATION

Is fuel leaking from the flow meter assembly piping (Figure 2, Items 1 or 2)?

FUEL LEAKS FROM FLOW METER ASSEMBLY - Continued

DECISION

YES - Proceed to Malfunction: Flow meter assembly piping faulty.
NO - Proceed to Step 3.

MALFUNCTION

Flow meter assembly piping faulty

ACTION

1. Repair flow meter assembly piping (WP 0105).
2. Verify condition is fixed by placing MFS TRM in recirculation mode (TM 10-4930-371-10) and observing for leaks.
3. Continue fueling operations if condition is fixed.

STEP

3. Check for leaks from flow meter assembly (Figure 1, Item 3).

CONDITION/INDICATION

Is fuel leaking from the flow meter assembly (Figure 1, Item 3)?

DECISION

YES - Proceed to Malfunction: Flow meter assembly faulty.
NO - Return MFS TRM to service.

MALFUNCTION

Flow meter assembly faulty

ACTION

1. Replace flow meter assembly (WP 0103).
2. Verify condition is fixed by placing MFS TRM in recirculation mode (TM 10-4930-371-10) and observing for leaks.
3. Continue fueling operations if condition is fixed.

END OF WORK PACKAGE

MAINTAINER TROUBLESHOOTING
FUEL LEAKS FROM PRECHECK VALVE (V16) TROUBLESHOOTING PROCEDURE

INITIAL SETUP:

Tools and Special Tools
Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
Fire extinguisher (TM 10-4930-371-10)
Gloves, disposible nitrile (WP 0216, Table 1, Item 5)
Goggles, industrial (WP 0216, Table 1, Item 6)

Materials/Parts
Absorbent material (WP 0216, Table 1, Item 1)

Personnel Required
91J Quartermaster and Chemical Equipment Repairer

References
ATP 4-43
WP 0078

Equipment Condition
MFS TRM grounded (TM 10-4930-371-10)
MFS TRM shut down (TM 10-4930-371-10)

Time to Complete
0.5 Hour(s)

GENERAL

This work package contains Maintainer troubleshooting procedures for MFS TRM. Use this work package to help isolate and correct system problems. Ensure all operator PMCS and troubleshooting procedures have been performed.

TROUBLESHOOTING PROCEDURE

FUEL LEAKS FROM PRECHECK VALVE (V16)

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Failure to comply could result in injury or death to personnel.

FUEL LEAKS FROM PRECHECK VALVE (V16) - Continued

STEP

1. Check for leaks from fittings attaching precheck valve (V16) (Figure 1, Item 1).

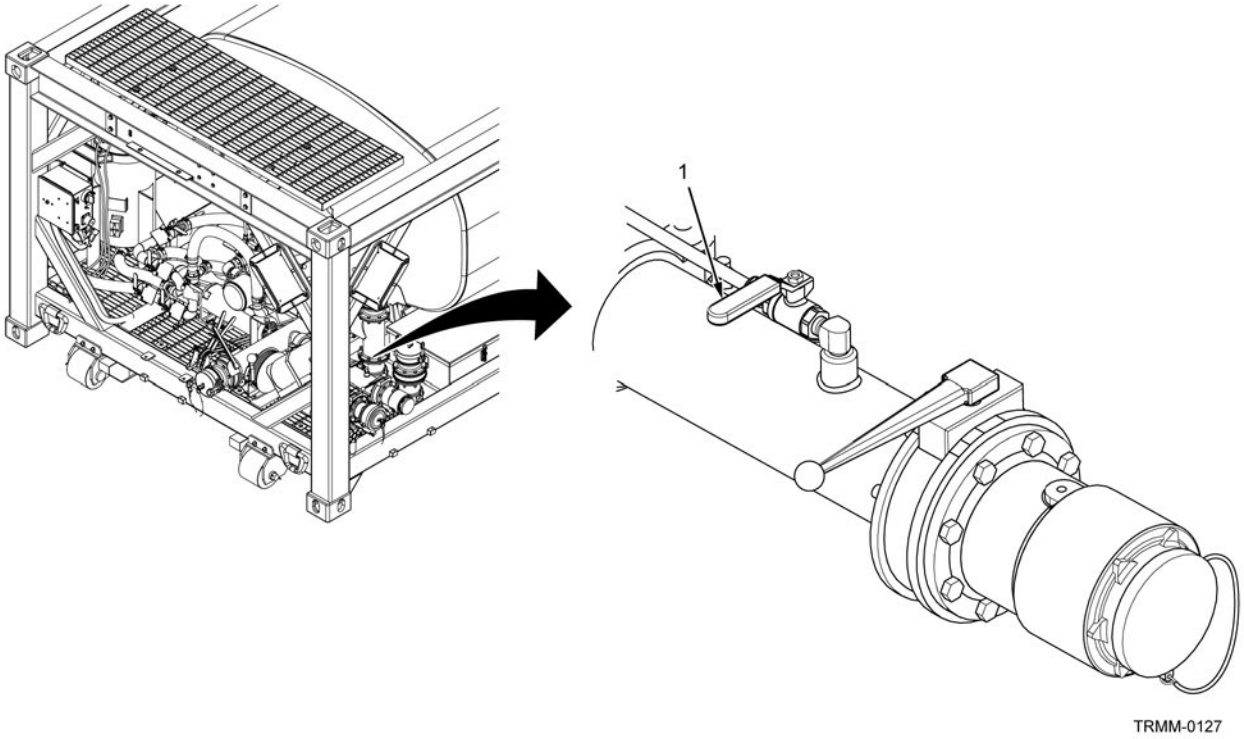


Figure 1. Precheck Valve (V16).

CONDITION/INDICATION

Is fuel leaking from fittings attaching precheck valve (V16) (Figure 1, Item 1)?

DECISION

YES - Proceed to Malfunction: Precheck valve (V16) connections leaking.
NO - Proceed to Step 2.

MALFUNCTION

Precheck valve (V16) connections leaking

ACTION

1. Remove precheck valve (V16) (WP 0078) and all associated fittings.
2. Clean threads of fittings, apply thread sealant, and install fittings.
3. Reinstall precheck valve (V16) (WP 0078).
4. Continue fueling operations if condition is fixed.

FUEL LEAKS FROM PRECHECK VALVE (V16) - Continued

STEP

2. Check for leaks from precheck valve (V16) (Figure 1, Item 1).

CONDITION/INDICATION

Is fuel leaking from precheck valve (V16) (Figure 1, Item 1)?

DECISION

YES - Proceed to Malfunction: Precheck valve (V16) faulty.
NO - Return MFS TRM to service.

MALFUNCTION

Precheck valve (V16) faulty

ACTION

1. Replace precheck valve (V16) (WP 0078).
2. Continue fueling operations if condition is fixed.

END OF WORK PACKAGE

MAINTAINER TROUBLESHOOTING
FUEL LEAKS FROM VACUUM BREAKER (VB1) TROUBLESHOOTING PROCEDURE

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposible nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)

Materials/Parts
- Absorbent material (WP 0216, Table 1, Item 1)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer

References
- ATP 4-43
- WP 0108

Equipment Condition
- MFS TRM grounded (TM 10-4930-371-10)
- MFS TRM shut down (TM 10-4930-371-10)

Time to Complete
- 0.5 Hour(s)

GENERAL

This work package contains Maintainer troubleshooting procedures for MFS TRM. Use this work package to help isolate and correct system problems. Ensure all operator PMCS and troubleshooting procedures have been performed.

TROUBLESHOOTING PROCEDURE

FUEL LEAKS FROM VACUUM BREAKER (VB1)

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Failure to comply could result in injury or death to personnel.

FUEL LEAKS FROM VACUUM BREAKER (VB1) - Continued

STEP

1. Check for leaks from fittings attaching vacuum breaker (VB1) (Figure 1, Item 1).

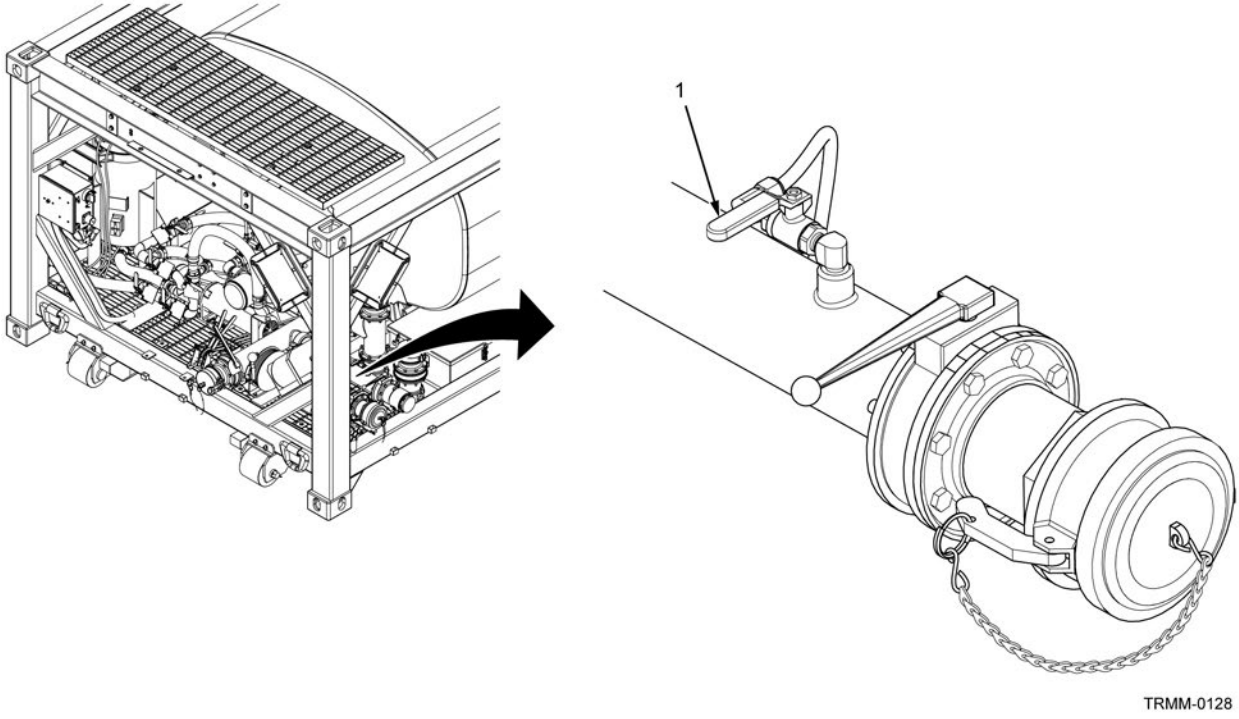


Figure 1. Vacuum Breaker (VB1).

CONDITION/INDICATION

Is fuel leaking from fittings attaching vacuum breaker (VB1) (Figure 1, Item 1)?

DECISION

YES - Proceed to Malfunction: Vacuum breaker (VB1) connections leaking.
NO - Proceed to Step 2.

MALFUNCTION

Vacuum breaker (VB1) connections leaking

ACTION

1. Remove vacuum breaker (VB1) (WP 0108) and all associated fittings.
2. Clean threads of fittings, reapply thread sealant, and replace.
3. Reinstall vacuum breaker (VB1) (WP 0108).
4. Continue fueling operations if condition is fixed.

STEP

2. Check for leaks from vacuum breaker (VB1) (Figure 1, Item 1).

FUEL LEAKS FROM VACUUM BREAKER (VB1) - Continued

CONDITION/INDICATION

Is fuel leaking from vacuum breaker (VB1) (Figure 1, Item 1)?

DECISION

YES - Proceed to Malfunction: Vacuum breaker (VB1) faulty.
NO - Return MFS TRM to service.

MALFUNCTION

Vacuum breaker (VB1) faulty

ACTION

1. Replace vacuum breaker (VB1) (WP 0108).
2. Continue fueling operations if condition is fixed.

END OF WORK PACKAGE

MAINTAINER TROUBLESHOOTING
FUEL LEAKS FROM PORT F (V17) DRY BREAK COUPLING TROUBLESHOOTING PROCEDURE

INITIAL SETUP:

Tools and Special Tools
Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
Fire extinguisher (TM 10-4930-371-10)
Gloves, disposible nitrile (WP 0216, Table 1, Item 5)
Goggles, industrial (WP 0216, Table 1, Item 6)

Materials/Parts
Absorbent material (WP 0216, Table 1, Item 1)

Personnel Required
91J Quartermaster and Chemical Equipment Repairer

References
ATP 4-43
WP 0059

Equipment Condition
MFS TRM grounded (TM 10-4930-371-10)
MFS TRM set on level ground (TM 10-4930-371-10)

Time to Complete
0.5 Hour(s)

GENERAL

This work package contains Maintainer troubleshooting procedures for MFS TRM. Use this work package to help isolate and correct system problems. Ensure all operator PMCS and troubleshooting procedures have been performed.

TROUBLESHOOTING PROCEDURE

FUEL LEAKS FROM PORT F (V17) DRY BREAK COUPLING

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Failure to comply could result in injury or death to personnel.

FUEL LEAKS FROM PORT F (V17) DRY BREAK COUPLING - Continued

STEP

1. Check for leaks from base of Port F (V17) (Figure 1, Item 1) dry break coupling.

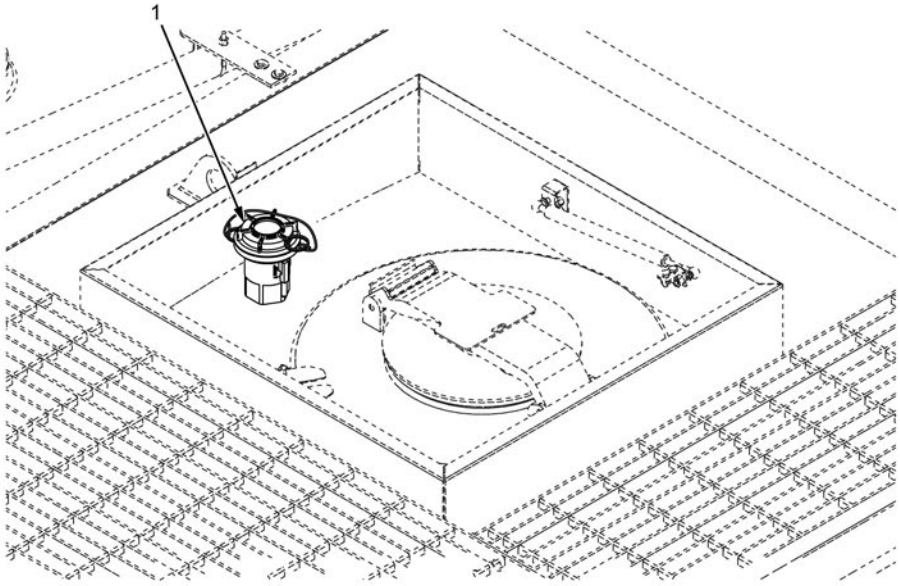


Figure 1. MFS TRM Port F (V17).

CONDITION/INDICATION

Is fuel leaking from base of Port F (V17) (Figure 1, Item 1) dry break coupling?

DECISION

YES - Proceed to Malfunction: Port F (V17) dry break coupling connection leaking.
NO - Proceed to Step 2.

MALFUNCTION

Port F (V17) dry break coupling connection leaking

ACTION

CAUTION

Ensure debris does not fall into tank. Damage to equipment can occur.

1. Remove Port F (V17) (Figure 1, Item 1) dry break coupling (WP 0059) from fitting.
2. Clean threads of fitting and threads on outside of spillbox pipe.
3. Reinstall Port F (V17) (Figure 1, Item 1) dry break coupling (WP 0059).
4. Return to Step 1 and repeat all troubleshooting steps if condition still exists.

FUEL LEAKS FROM PORT F (V17) DRY BREAK COUPLING - Continued

5. Continue fueling operations if condition is fixed.

STEP

2. Check for leaks from Port F (V17) (Figure 1, Item 1) dry break coupling.

CONDITION/INDICATION

Is fuel leaking from Port F (V17) dry break coupling?

DECISION

YES - Proceed to Malfunction: Port F (V17) dry break coupling faulty.
NO - Return MFS TRM to service.

MALFUNCTION

Port F (V17) dry break coupling faulty

ACTION

1. Replace Port F (V17) (Figure 1, Item 1) dry break coupling (WP 0059).
2. Continue fueling operations if condition is fixed.

END OF WORK PACKAGE

MAINTAINER TROUBLESHOOTING
FUEL LEAKS FROM FILTER/SEPARATOR ASSEMBLY TROUBLESHOOTING PROCEDURE

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposible nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)

Materials/Parts
- Absorbent material (WP 0216, Table 1, Item 1)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer

References
- ATP 4-43
- TM 10-4930-371-10
- WP 0083
- WP 0134
- WP 0135
- WP 0136
- WP 0139

Equipment Condition
- MFS TRM prepared for use (TM 10-4930-371-10)

Time to Complete
- 0.5 Hour(s)

GENERAL

This work package contains Maintainer troubleshooting procedures for MFS TRM. Use this work package to help isolate and correct system problems. Ensure all operator PMCS and troubleshooting procedures have been performed.

TROUBLESHOOTING PROCEDURE

FUEL LEAKS FROM FILTER/SEPARATOR ASSEMBLY

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Failure to comply could result in injury or death to personnel.

FUEL LEAKS FROM FILTER/SEPARATOR ASSEMBLY - Continued

STEP

1. Check for leaks from top of filter/separator assembly (Figure 1, Item 1).

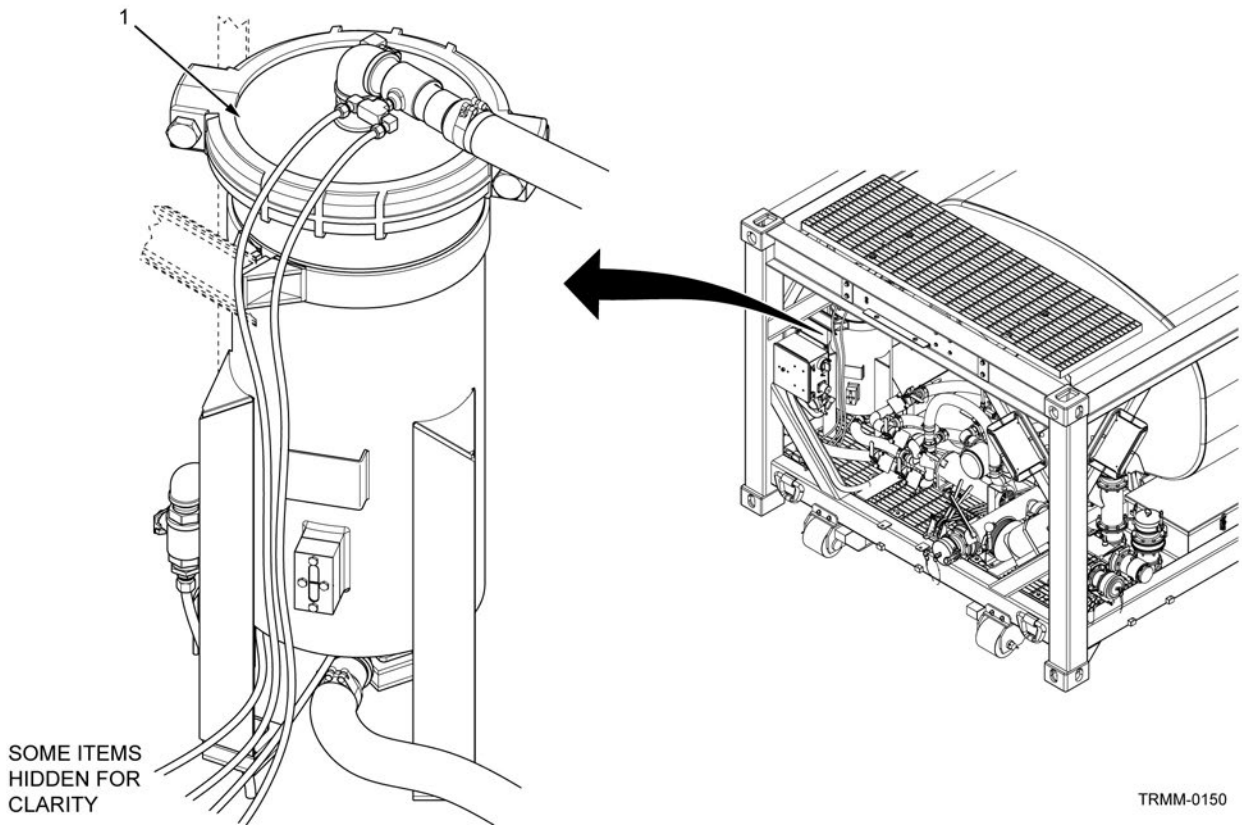


Figure 1. Filter/Separator Assembly Lid.

CONDITION/INDICATION

Is fuel leaking from around lid of filter/separator assembly (Figure 1, Item 1)?

DECISION

YES - Proceed to Malfunction: Filter/separator assembly lid gasket faulty.
NO - Proceed to Step 2.

MALFUNCTION

Filter/separator assembly lid gasket faulty

ACTION

1. Replace filter/separator assembly lid gasket (WP 0134).
2. Verify condition is fixed by placing MFS TRM into recirculation mode (TM 10-4930-371-10) and observing for leaks.
3. Continue fueling operations if condition is fixed.

FUEL LEAKS FROM FILTER/SEPARATOR ASSEMBLY - Continued

STEP

2. Check for leaks from filter/separator assembly inlet connection (Figure 2, Item 2) or outlet connection (Figure 2, Item 1).

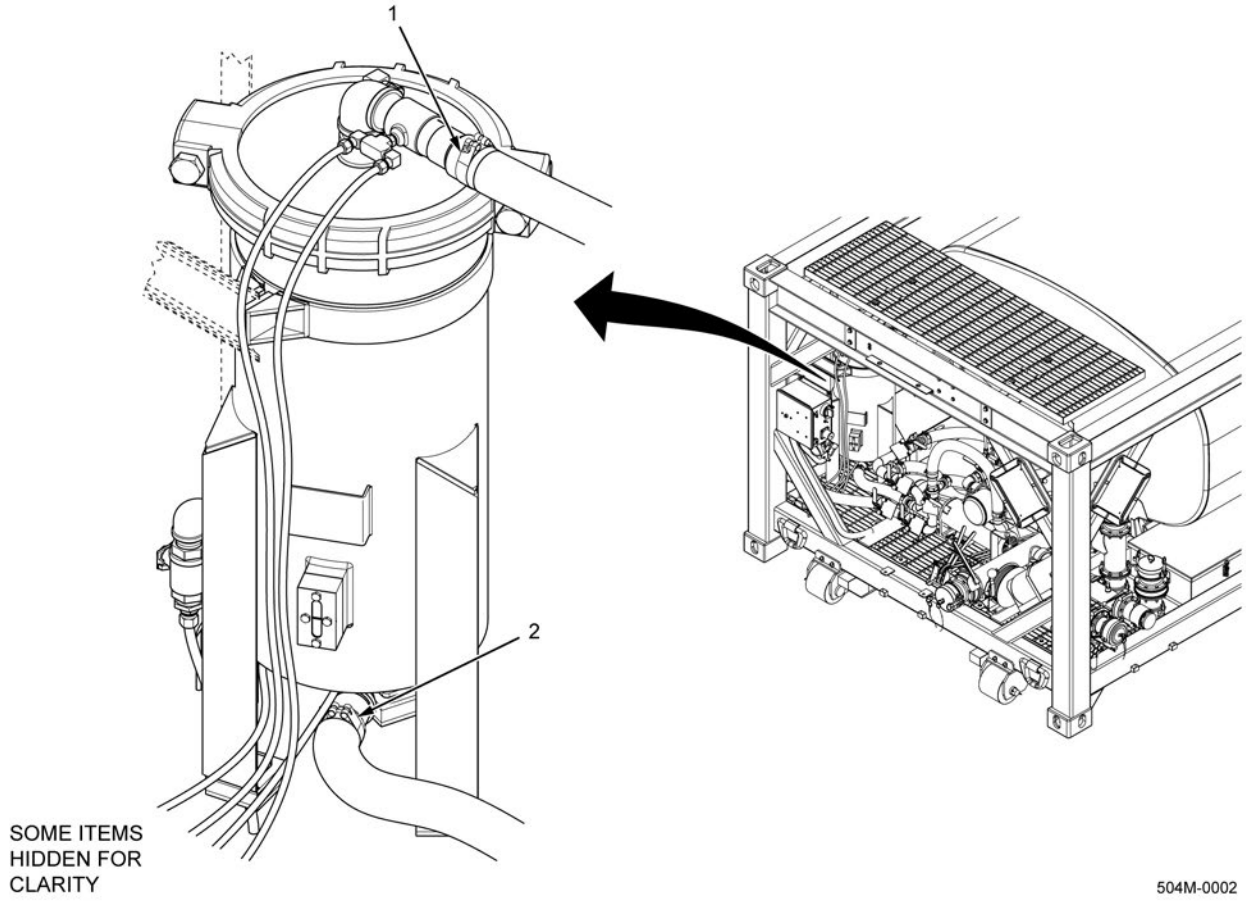


Figure 2. Filter/Separator Assembly Inlet and Outlet Connections.

CONDITION/INDICATION

Is fuel leaking from inlet (Figure 2, Item 2) or outlet connection (Figure 2, Item 1) of filter/separator assembly?

DECISION

YES - Proceed to Malfunction: Inlet/outlet connections leaking.
NO - Proceed to Step 3.

MALFUNCTION

Inlet/outlet connections leaking

ACTION

1. Check hoses for cracks, loose connections, or other indications of leakage.

FUEL LEAKS FROM FILTER/SEPARATOR ASSEMBLY - Continued

2. If connections are loose, tighten hose clamps on hoses. If hose is visibly damaged, replace hose (WP 0083).
3. Verify condition is fixed by placing MFS TRM into recirculation mode (TM 10-4930-371-10) and observing for leaks.
4. Continue fueling operations if condition is fixed.

STEP

3. Check for leaks from filter/separator assembly water drain valve (Figure 3, Item 2) or fuel drain valve (Figure 3, Item 1).

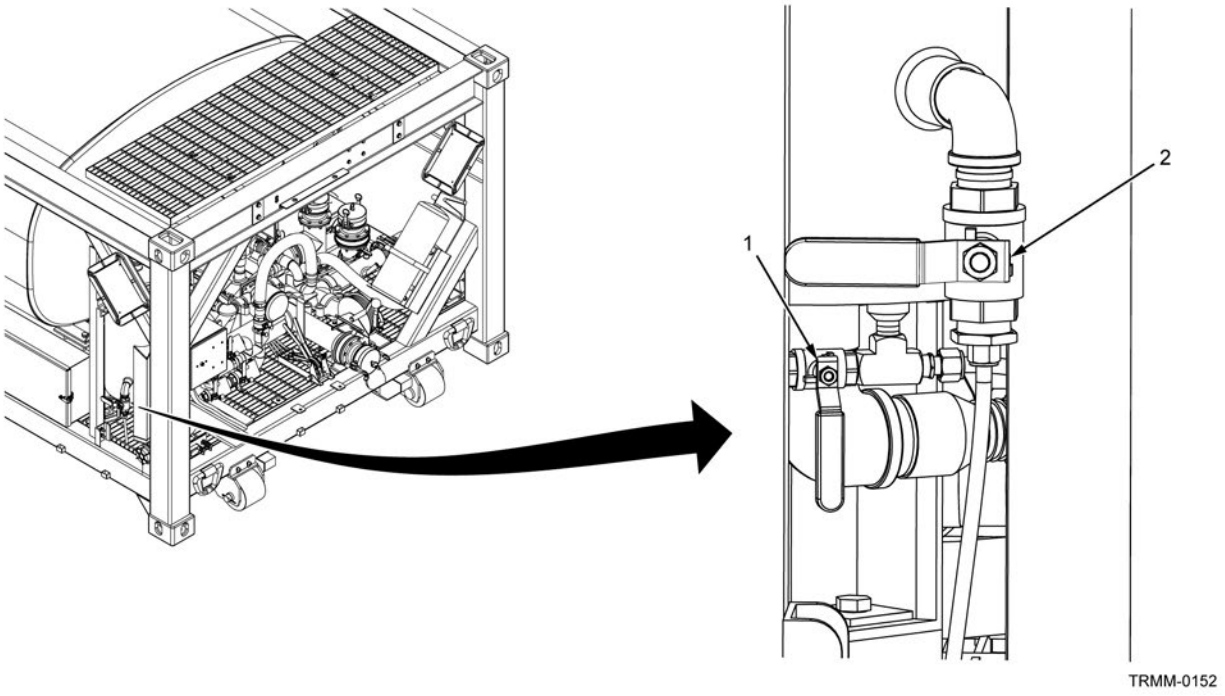


Figure 3. Filter/Separator Assembly Drain Valves.

CONDITION/INDICATION

Is fuel leaking from filter/separator assembly water drain valve (Figure 3, Item 2) or fuel drain valve (Figure 3, Item 1)?

DECISION

YES - Proceed to Malfunction: Drain valves and/or connecting fittings leaking.
NO - Proceed to Step 4.

MALFUNCTION

Drain valves and/or connecting fittings leaking

ACTION

1. Remove and repair leaking drain valve: Fuel (WP 0135), water (WP 0136) and all associated fittings.

FUEL LEAKS FROM FILTER/SEPARATOR ASSEMBLY - Continued

2. Clean threads of fittings, and reapply thread sealant.
3. Install drain valve: Fuel (WP 0135), water (WP 0136).
4. Verify condition is fixed by placing MFS TRM into recirculation mode (TM 10-4930-371-10) and observing for leaks.
5. Continue fueling operations if condition is fixed.

STEP

4. Check for leaks from sight gauge (Figure 4, Item 1) on filter/separator assembly.

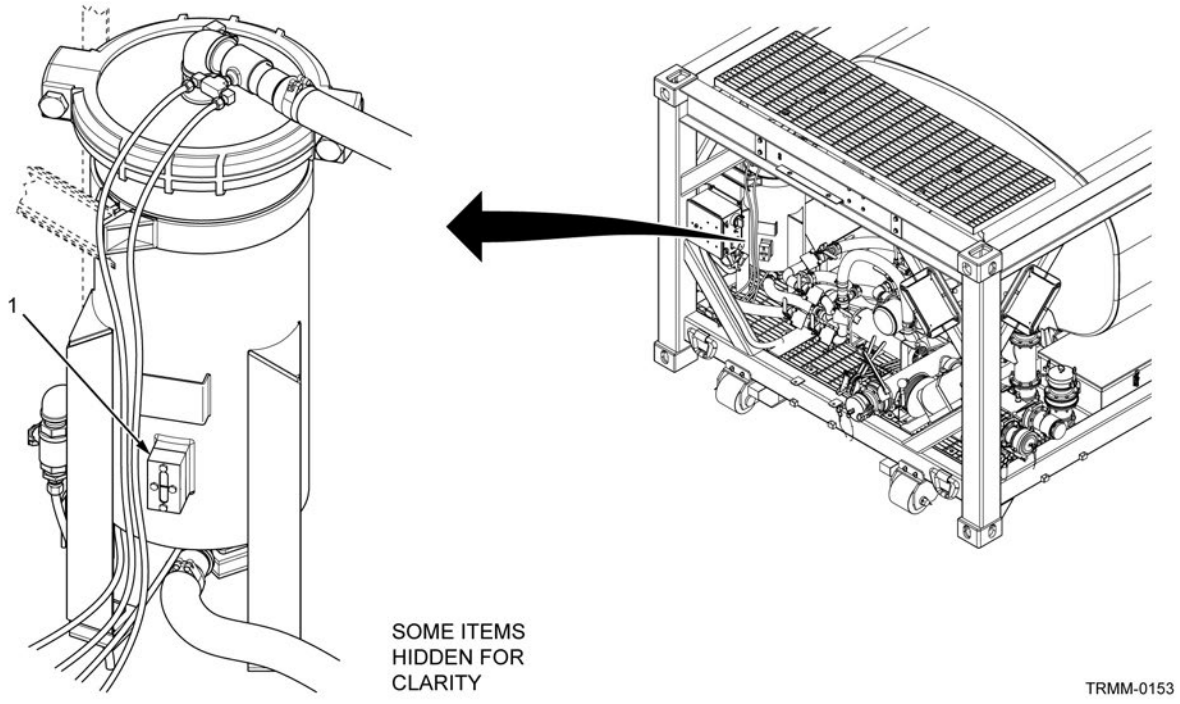


Figure 4. Filter/Separator Sight Gauge.

CONDITION/INDICATION

Is fuel leaking from sight gauge (Figure 4, Item 1) on filter/separator assembly?

DECISION

YES - Proceed to Malfunction: Sight gauge leaking.
NO - Continue fueling operations if condition is fixed.

MALFUNCTION

Sight gauge leaking

ACTION

1. Replace sight gauge (Figure 4, Item 1) and associated gasket (WP 0139).

FUEL LEAKS FROM FILTER/SEPARATOR ASSEMBLY - Continued

2. Verify condition is fixed by placing MFS TRM into recirculation mode (TM 10-4930-371-10) and observing for leaks.
3. Continue fueling operations if condition is fixed.

END OF WORK PACKAGE

MAINTAINER TROUBLESHOOTING
FUEL LEAKS FROM PUMP ASSEMBLY TROUBLESHOOTING PROCEDURE

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposible nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)

Materials/Parts
- Absorbent material (WP 0216, Table 1, Item 1)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer

References
- ATP 4-43

References (cont.)
- TM 10-4930-371-10
- WP 0080
- WP 0083

Equipment Condition
- MFS TRM prepared for use (TM 10-4930-371-10)

Time to Complete
- 0.5 Hour(s)

GENERAL

This work package contains Maintainer troubleshooting procedures for MFS TRM. Use this work package to help isolate and correct system problems. Ensure all operator PMCS and troubleshooting procedures have been performed.

TROUBLESHOOTING PROCEDURE

FUEL LEAKS FROM PUMP ASSEMBLY

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Failure to comply could result in injury or death to personnel.

STEP

1. Check for leaks from inlet hose connection (Figure 1, Item 1) of pump assembly (Figure 1, Item 3).

CONDITION/INDICATION

Is fuel leaking from inlet hose connection (Figure 1, Item 1)?

FUEL LEAKS FROM PUMP ASSEMBLY - Continued

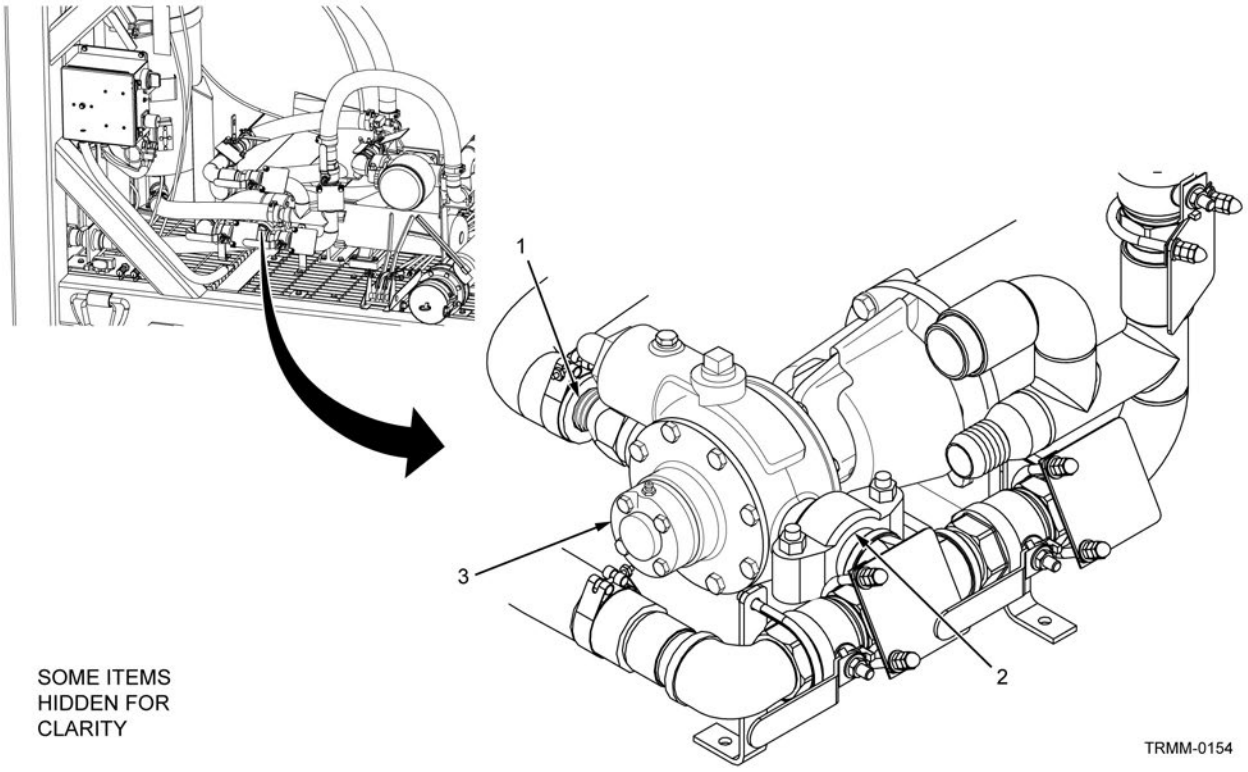


Figure 1. Pump Assembly Connections.

DECISION

YES - Proceed to Malfunction: Inlet hose connection leaking.
NO - Proceed to Step 2.

MALFUNCTION

Inlet hose connection leaking

ACTION

1. Check hose for cracks, loose connections, or other indications of leakage.
2. If connections are loose, tighten hose clamps on hoses. If hose is visibly damaged, replace hose (WP 0083).
3. Verify condition is fixed by placing MFS TRM into recirculation mode (TM 10-4930-371-10) and observing for leaks.
4. Continue fueling operations if condition is fixed.

STEP

2. Check for leaks from outlet connection coupling (Figure 1, Item 2) of pump assembly (Figure 1, Item 3).

CONDITION/INDICATION

Is fuel leaking from outlet connection coupling (Figure 1, Item 2)?

FUEL LEAKS FROM PUMP ASSEMBLY - Continued

DECISION

YES - Proceed to Malfunction: Outlet coupling leaking.
NO - Proceed to Step 3.

MALFUNCTION

Outlet coupling leaking

ACTION

1. Remove pump assembly (WP 0080) and replace coupling gasket in outlet coupling.
2. Verify condition is fixed by placing MFS TRM into recirculation mode (TM 10-4930-371-10) and observing for leaks.
3. Continue fueling operations if condition is fixed.

STEP

3. Check for leaks from pump assembly (Figure 1, Item 3).

CONDITION/INDICATION

Is fuel leaking from pump assembly (Figure 1, Item 3)?

DECISION

YES - Proceed to Malfunction: Pump assembly faulty.
NO - Continue fueling operations if condition is fixed.

MALFUNCTION

Pump assembly faulty

ACTION

1. Replace pump assembly (WP 0080).
2. Verify condition is fixed by placing MFS TRM into recirculation mode (TM 10-4930-371-10) and observing for leaks.
3. Continue fueling operations if condition is fixed.

END OF WORK PACKAGE

MAINTAINER TROUBLESHOOTING
FUEL LEAKS FROM VAPOR RECOVERY LINE DURING TRANSPORT OPERATIONS TROUBLESHOOTING PROCEDURE

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposible nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)
- Pan, drip (WP 0217, Table 1, Item 8)

Materials/Parts
- Absorbent material (WP 0216, Table 1, Item 1)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer

References
- ATP 4-43

References (cont.)
- TM 10-4930-371-10
- WP 0058

Equipment Condition
- MFS TRM grounded (TM 10-4930-371-10)

Time to Complete
- 0.5 Hour(s)

GENERAL

This work package contains Maintainer troubleshooting procedures for MFS TRM. Use this work package to help isolate and correct system problems. Ensure all operator PMCS and troubleshooting procedures have been performed.

TROUBLESHOOTING PROCEDURE

FUEL LEAKS FROM VAPOR RECOVERY LINE DURING TRANSPORT OPERATIONS

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Failure to comply could result in injury or death to personnel.

STEP

1. Place drip pan to catch residual fuel under vapor recovery line.
2. Remove vapor recovery line dust cap (Figure 1, Item 2) and check for fuel in line.

FUEL LEAKS FROM VAPOR RECOVERY LINE DURING TRANSPORT OPERATIONS - Continued

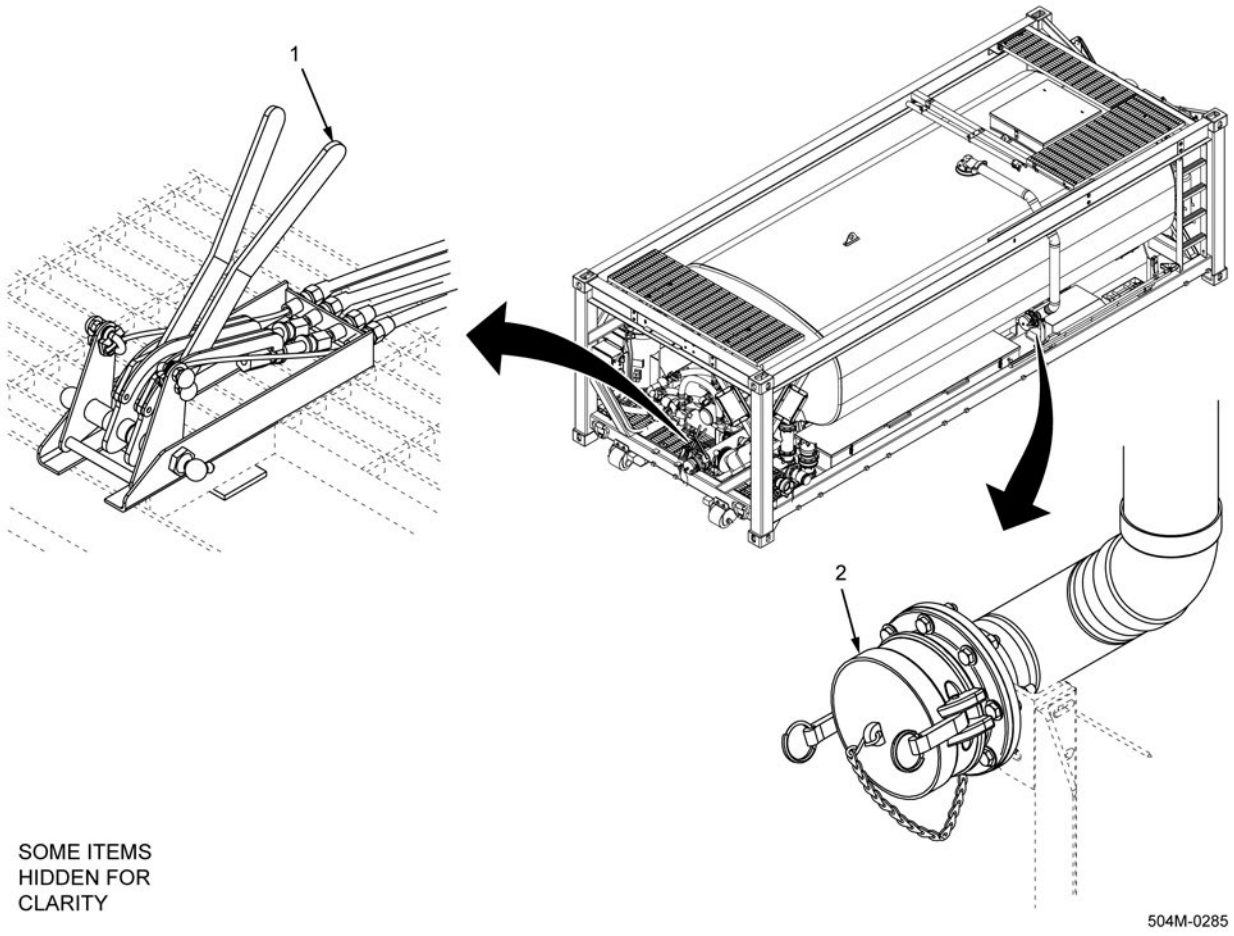


Figure 1. Vapor Recovery Line.

CONDITION/INDICATION

Is fuel leaking from vapor recovery line?

DECISION

YES - Proceed to Malfunction: V1 valve open.
NO - Proceed to Malfunction: Vent valve faulty.

MALFUNCTION

V1 valve open

ACTION

1. Close V1 valve lever (Figure 1, Item 2).
2. Verify condition is fixed by transporting full MFS TRM.
3. Continue fueling operations if condition is fixed.

MALFUNCTION

FUEL LEAKS FROM VAPOR RECOVERY LINE DURING TRANSPORT OPERATIONS - Continued

Vent valve faulty

ACTION

1. Replace defective vent valve (WP 0058).
2. Verify condition is fixed by transporting full MFS TRM.
3. Continue fueling operations if condition is fixed.

END OF WORK PACKAGE

MAINTAINER TROUBLESHOOTING
FUEL LEAKS FROM TEE ASSEMBLY TROUBLESHOOTING PROCEDURE

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposible nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)

Materials/Parts
- Absorbent material (WP 0216, Table 1, Item 1)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer

References
- ATP 4-43
- WP 0082

Equipment Condition
- MFS TRM grounded (TM 10-4930-371-10)
- MFS TRM shut down (TM 10-4930-371-10)

Time to Complete
- 0.5 Hour(s)

GENERAL

This work package contains Maintainer troubleshooting procedures for MFS TRM. Use this work package to help isolate and correct system problems. Ensure all operator PMCS and troubleshooting procedures have been performed.

TROUBLESHOOTING PROCEDURE

FUEL LEAKS FROM TEE ASSEMBLY

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Failure to comply could result in injury or death to personnel.

FUEL LEAKS FROM TEE ASSEMBLY - Continued

STEP

1. Check for leaks from gaskets (Figure 1, Items 1, 3, or 5) of tee assembly (Figure 1, Item 2).

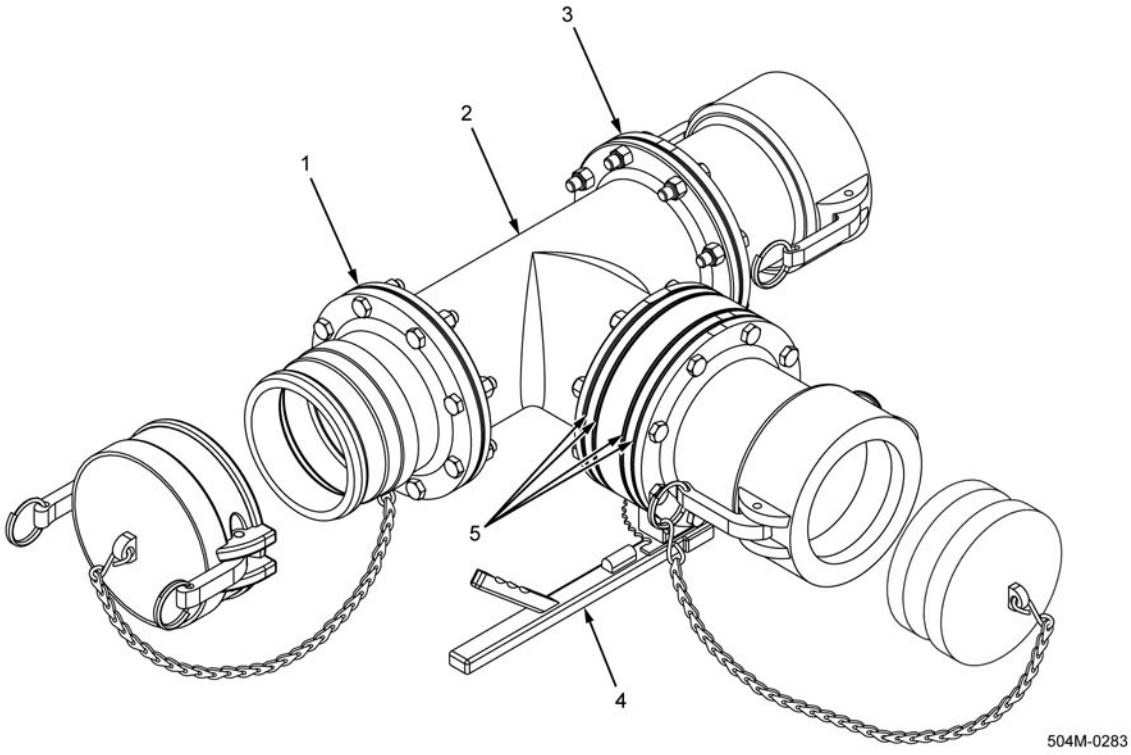


Figure 1. Tee Assembly.

CONDITION/INDICATION

Is fuel leaking from gaskets (Figure 1, Items 1, 3, or 5) of tee assembly (Figure 1, Item 2)?

DECISION

YES - Proceed to Malfunction: Gasket(s) faulty.
NO - Proceed to Step 2.

MALFUNCTION

Gasket(s) faulty

ACTION

1. Note location of leak and repair tee assembly (WP 0082) as required.
2. Continue fueling operations if condition is fixed.

STEP

2. Check for leaks from tee assembly butterfly valve (Figure 1, Item 4).

FUEL LEAKS FROM TEE ASSEMBLY - Continued

CONDITION/INDICATION

Is fuel leaking from butterfly valve (Figure 1, Item 4) of tee assembly (Figure 1, Item 2)?

DECISION

YES - Proceed to Malfunction: Butterfly valve faulty.
NO - Return tee assembly to service.

MALFUNCTION

Butterfly valve faulty

ACTION

1. Replace tee assembly butterfly valve (WP 0082).
2. Return tee assembly to service if condition is fixed.

END OF WORK PACKAGE

MAINTAINER TROUBLESHOOTING
FUEL LEAKS FROM VALVE ADAPTER ASSEMBLY TROUBLESHOOTING PROCEDURE

INITIAL SETUP:

Tools and Special Tools
Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
Fire extinguisher (TM 10-4930-371-10)
Gloves, disposible nitrile (WP 0216, Table 1, Item 5)
Goggles, industrial (WP 0216, Table 1, Item 6)

Materials/Parts
Absorbent material (WP 0216, Table 1, Item 1)

Personnel Required
91J Quartermaster and Chemical Equipment Repairer

References
ATP 4-43
WP 0081

Equipment Condition
MFS TRM grounded (TM 10-4930-371-10)
MFS TRM shut down (TM 10-4930-371-10)

Time to Complete
0.5 Hour(s)

GENERAL

This work package contains Maintainer troubleshooting procedures for MFS TRM. Use this work package to help isolate and correct system problems. Ensure all operator PMCS and troubleshooting procedures have been performed.

TROUBLESHOOTING PROCEDURE

FUEL LEAKS FROM VALVE ADAPTER ASSEMBLY

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Failure to comply could result in injury or death to personnel.

FUEL LEAKS FROM VALVE ADAPTER ASSEMBLY - Continued

STEP

1. Check for leaks from gaskets (Figure 1, Item 3) of valve adapter assembly (Figure 1, Item 2).

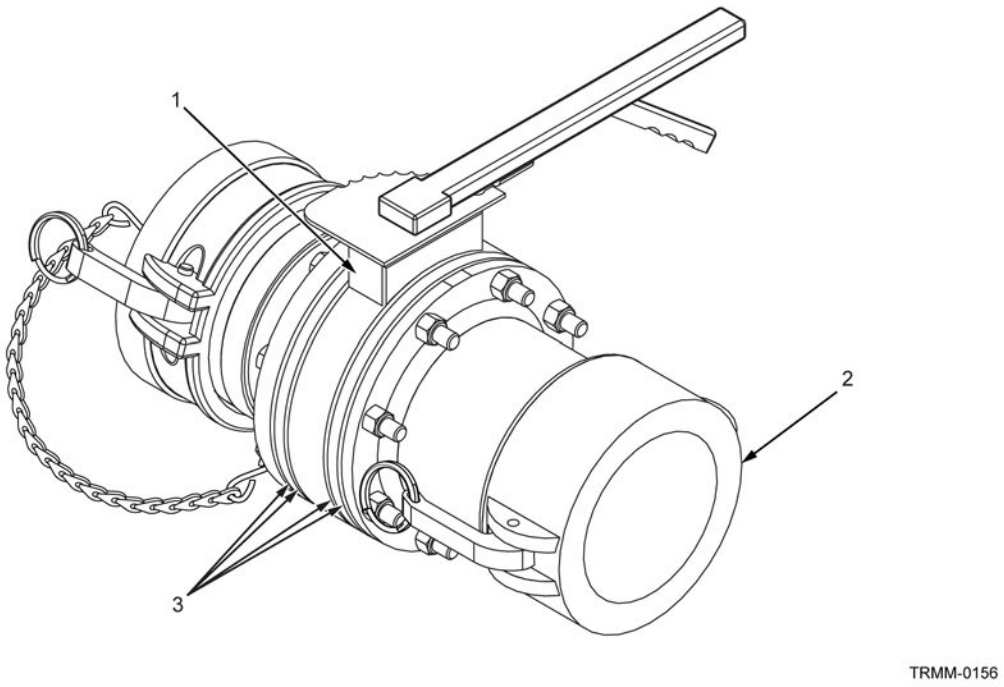


Figure 1. Valve Adapter Assembly.

CONDITION/INDICATION

Is fuel leaking from gaskets (Figure 1, Item 3) of valve adapter assembly (Figure 1, Item 2)?

DECISION

YES - Proceed to Malfunction: Gasket(s) faulty.
NO - Proceed to Step 2.

MALFUNCTION

Gasket(s) faulty

ACTION

1. Note location of leak and repair valve adapter assembly (WP 0081) as required.
2. Continue fueling operations if condition is fixed.

STEP

2. Check for leaks from valve adapter assembly butterfly valve (Figure 1, Item 1).

FUEL LEAKS FROM VALVE ADAPTER ASSEMBLY - Continued

CONDITION/INDICATION

Is fuel leaking from valve adapter assembly butterfly valve (Figure 1, Item 1) of valve adapter assembly (Figure 1, Item 2)?

DECISION

YES - Proceed to Malfunction: Butterfly valve faulty.
NO - Return valve adapter assembly to service.

MALFUNCTION

Butterfly valve faulty

ACTION

1. Replace valve adapter assembly butterfly valve (WP 0081).
2. Return valve adapter assembly to service if condition is fixed.

END OF WORK PACKAGE

MAINTAINER TROUBLESHOOTING
CANNOT CONNECT COMPONENTS TO CAMLOCK COUPLING (PORT B, PORT G, OR PORT C)
TROUBLESHOOTING PROCEDURE

INITIAL SETUP:

Tools and Special Tools
Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
Fire extinguisher (TM 10-4930-371-10)
Gloves, disposible nitrile (WP 0216, Table 1, Item 5)
Goggles, industrial (WP 0216, Table 1, Item 6)

Materials/Parts
Absorbent material (WP 0216, Table 1, Item 1)

Personnel Required
91J Quartermaster and Chemical Equipment Repairer

References
ATP 4-43
WP 0090
WP 0091
WP 0093

Equipment Condition
MFS TRM grounded (TM 10-4930-371-10)
MFS TRM set on level ground (TM 10-4930-371-10)

Time to Complete
1.0 Hour(s)

GENERAL

This work package contains Maintainer troubleshooting procedures for MFS TRM. Use this work package to help isolate and correct system problems. Ensure all operator PMCS and troubleshooting procedures have been performed.

TROUBLESHOOTING PROCEDURE

CANNOT CONNECT COMPONENTS TO CAMLOCK COUPLING (PORT B, PORT G, OR PORT C)

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Failure to comply could result in injury or death to personnel.

CANNOT CONNECT COMPONENTS TO CAMLOCK COUPLING (PORT B, PORT G, OR PORT C) - Continued

STEP

1. Confirm that camlock connectors (Figure 1, Items 1, 2, and 3) cannot be connected to other components.

CONDITION/INDICATION

Is fault confirmed?

DECISION

YES - Proceed to Malfunction: Camlock coupling faulty.
NO - Return MFS TRM to service.

MALFUNCTION

Camlock coupling faulty

ACTION

1. Refer to appropriate work package and replace port coupling:
   - Port G (V3) (WP 0091)
   - Port B (V4) (WP 0090)
   - Port C (V6) (WP 0093)

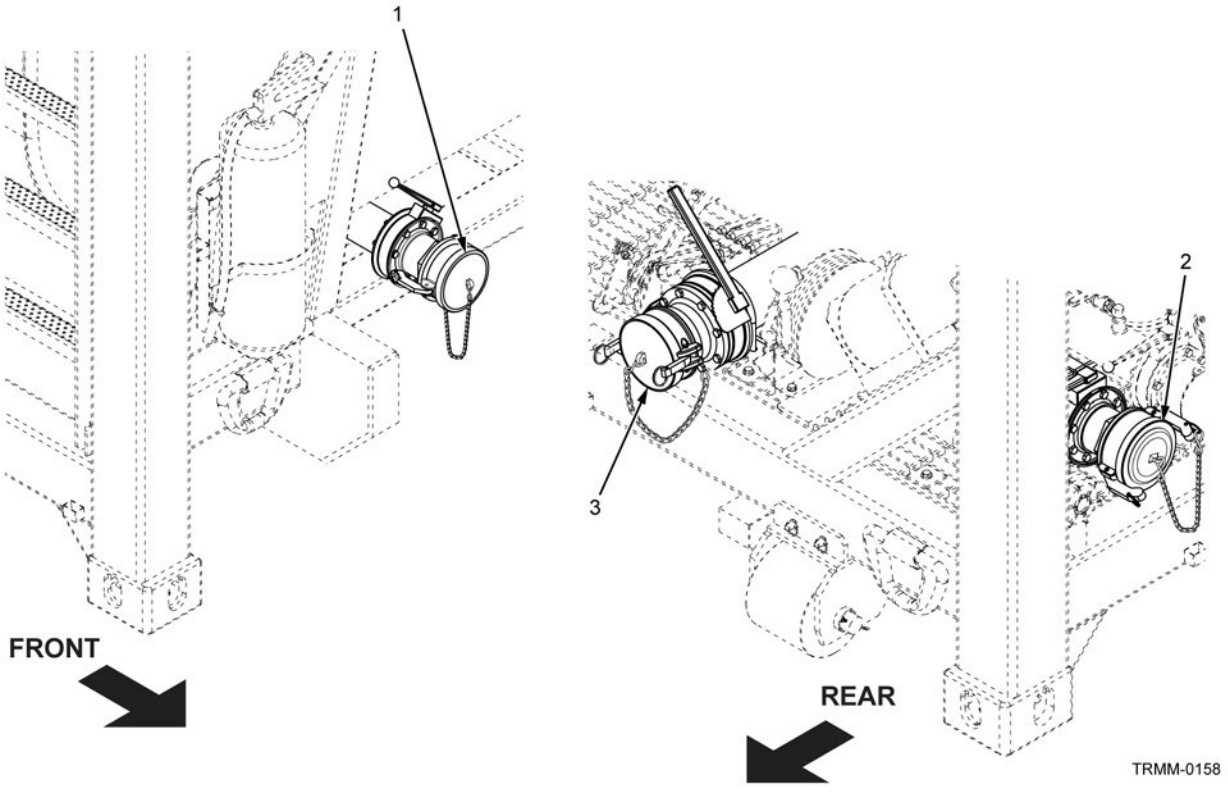


Figure 1. MFS TRM Ports B, C, and G.

CANNOT CONNECT COMPONENTS TO CAMLOCK COUPLING (PORT B, PORT G, OR PORT C) - Continued

2. Return MFS TRM to service if condition is fixed.

END OF WORK PACKAGE

MAINTAINER TROUBLESHOOTING
CANNOT CONNECT COMPONENTS TO DRY BREAK COUPLING (PORT D, PORT E, OR PORT F)
TROUBLESHOOTING PROCEDURE

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposible nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)

Materials/Parts
- Absorbent material (WP 0216, Table 1, Item 1)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer

References
- ATP 4-43

References (cont.)
- WP 0059
- WP 0095

Equipment Condition
- MFS TRM grounded (TM 10-4930-371-10)
- MFS TRM set on level ground (TM 10-4930-371-10)

Time to Complete
- 0.5 Hour(s)

GENERAL

This work package contains Maintainer troubleshooting procedures for MFS TRM. Use this work package to help isolate and correct system problems. Ensure all operator PMCS and troubleshooting procedures have been performed.

TROUBLESHOOTING PROCEDURE

CANNOT CONNECT COMPONENTS TO DRY BREAK COUPLING (PORT D, PORT E, OR PORT F)

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Failure to comply could result in injury or death to personnel.

STEP

1. Confirm that dry break connectors (Figure 1, Items 1, 2, or 3) cannot be connected to other components.

CANNOT CONNECT COMPONENTS TO DRY BREAK COUPLING (PORT D, PORT E, OR PORT F) - Continued

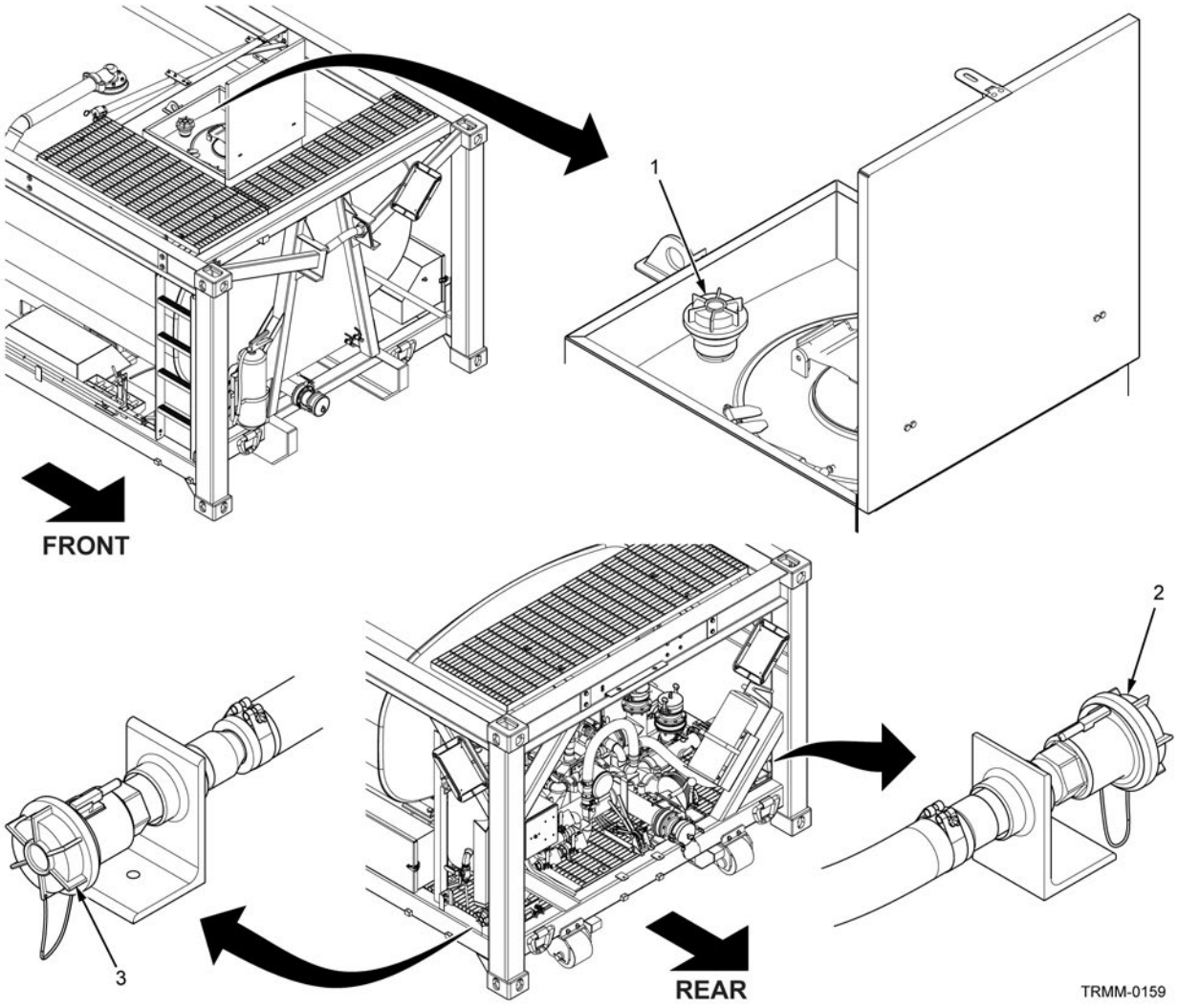


Figure 1. MFS TRM Ports.

CONDITION/INDICATION

Is fault confirmed?

DECISION

YES - Proceed to Malfunction: Dry break connector faulty.
NO - Return MFS TRM to service.

MALFUNCTION

Dry break connector faulty

CANNOT CONNECT COMPONENTS TO DRY BREAK COUPLING (PORT D, PORT E, OR PORT F) - Continued

ACTION

1. Refer to appropriate work package and replace port coupling:
   Port D (V7) and Port E (V8) (WP 0095)
   Port F (V17) (WP 0059)
2. Return MFS TRM to service if condition is fixed.

END OF WORK PACKAGE

MAINTAINER TROUBLESHOOTING
CANNOT CONNECT COMPONENTS TO PORT A TROUBLESHOOTING PROCEDURE

INITIAL SETUP:

Tools and Special Tools
Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
Fire extinguisher (TM 10-4930-371-10)
Gloves, disposible nitrile (WP 0216, Table 1, Item 5)
Goggles, industrial (WP 0216, Table 1, Item 6)

Materials/Parts
Absorbent material (WP 0216, Table 1, Item 1)

Personnel Required
91J Quartermaster and Chemical Equipment Repairer

References
ATP 4-43
WP 0092

Equipment Condition
MFS TRM grounded (TM 10-4930-371-10)
MFS TRM set on level ground (TM 10-4930-371-10)

Time to Complete
0.5 Hour(s)

GENERAL

This work package contains Maintainer troubleshooting procedures for MFS TRM. Use this work package to help isolate and correct system problems. Ensure all operator PMCS and troubleshooting procedures have been performed.

TROUBLESHOOTING PROCEDURE

CANNOT CONNECT COMPONENTS TO PORT A

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Failure to comply could result in injury or death to personnel.

CANNOT CONNECT COMPONENTS TO PORT A - Continued

STEP

1. Confirm that Port A D1 connector (Figure 1, Item 1) cannot be connected to D1 nozzle.

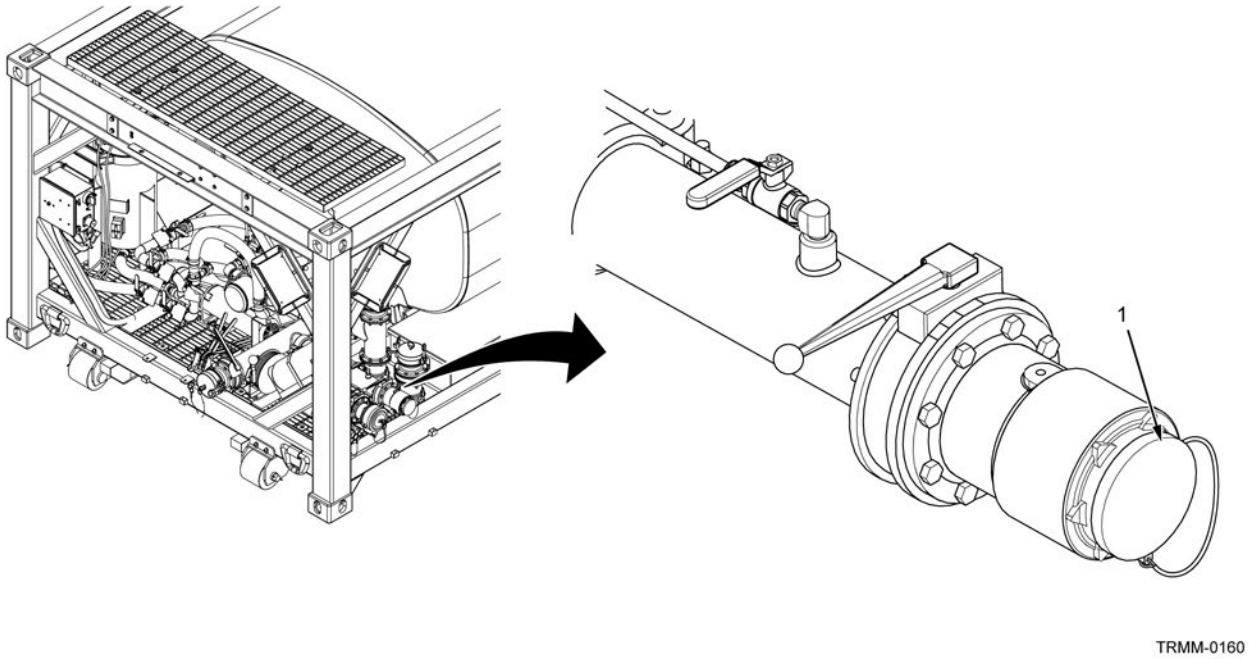


Figure 1. MFS TRM Port A.

CONDITION/INDICATION

Is fault confirmed?

DECISION

YES - Proceed to Malfunction: Port A faulty.
NO - Return MFS TRM to service.

MALFUNCTION

Port A faulty

ACTION

1. Replace port coupling (WP 0092).
2. Return MFS TRM to service if condition is fixed.

END OF WORK PACKAGE

MAINTAINER TROUBLESHOOTING
CANNOT CONNECT COMPONENTS TO VALVE ADAPTER ASSEMBLY OR TEE ASSEMBLY TROUBLESHOOTING PROCEDURE

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposible nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)

Materials/Parts
- Absorbent material (WP 0216, Table 1, Item 1)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer

References
- ATP 4-43

References (cont.)
- WP 0081
- WP 0082

Equipment Condition
- MFS TRM grounded (TM 10-4930-371-10)
- MFS TRM set on level ground (TM 10-4930-371-10)

Time to Complete
- 0.5 Hour(s)

GENERAL

This work package contains Maintainer troubleshooting procedures for MFS TRM. Use this work package to help isolate and correct system problems. Ensure all operator PMCS and troubleshooting procedures have been performed.

TROUBLESHOOTING PROCEDURE

CANNOT CONNECT COMPONENTS TO VALVE ADAPTER ASSEMBLY OR TEE ASSEMBLY

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Failure to comply could result in injury or death to personnel.

STEP

1. Confirm that camlock connectors on valve adapter assembly (Figure 1, Item 1) or tee assembly (Figure 1, Item 2) cannot be connected to other components.

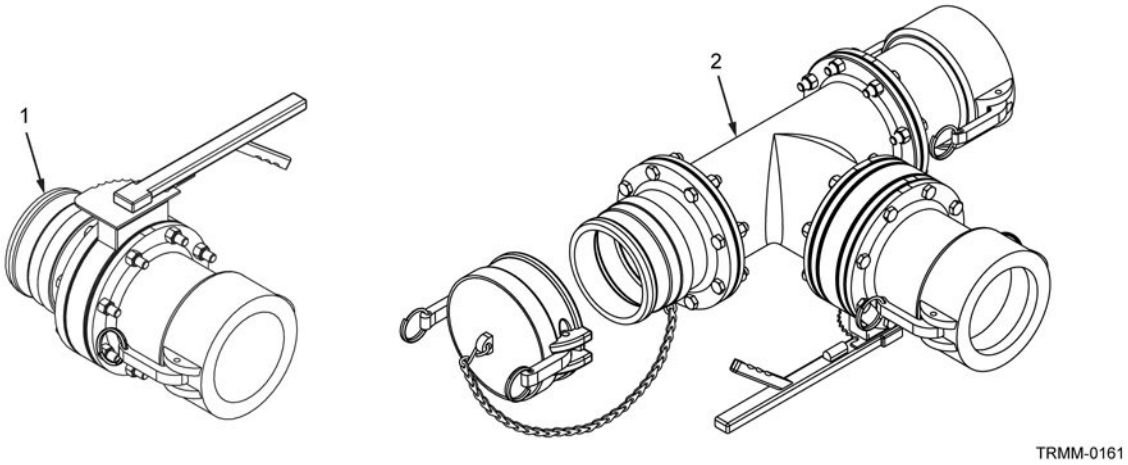


Figure 1. Valve Adapter Assembly and Tee Assembly.

CONDITION/INDICATION

Is fault confirmed?

DECISION

YES - Proceed to Malfunction: Camlock coupling faulty.

CANNOT CONNECT COMPONENTS TO VALVE ADAPTER ASSEMBLY OR TEE ASSEMBLY - Continued

NO - Return MFS TRM to service.

MALFUNCTION

Camlock coupling faulty

ACTION

1. Refer to appropriate work package and repair port coupling:
   Valve adapter assembly (WP 0081)
   Tee assembly (WP 0082)
2. Return MFS TRM to service if condition is fixed.

END OF WORK PACKAGE

MAINTAINER TROUBLESHOOTING
CANNOT CONNECT NOZZLE ASSEMBLY TO HOSE ASSEMBLY TROUBLESHOOTING PROCEDURE

INITIAL SETUP:

Tools and Special Tools
Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
Fire extinguisher (TM 10-4930-371-10)
Gloves, disposible nitrile (WP 0216, Table 1, Item 5)
Goggles, industrial (WP 0216, Table 1, Item 6)

Materials/Parts
Absorbent material (WP 0216, Table 1, Item 1)

Personnel Required
91J Quartermaster and Chemical Equipment Repairer

References
ATP 4-43
WP 0125

Equipment Condition
MFS TRM grounded (TM 10-4930-371-10)
MFS TRM set on level ground (TM 10-4930-371-10)

Time to Complete
0.2 Hour(s)

GENERAL

This work package contains Maintainer troubleshooting procedures for MFS TRM. Use this work package to help isolate and correct system problems. Ensure all operator PMCS and troubleshooting procedures have been performed.

TROUBLESHOOTING PROCEDURE

CANNOT CONNECT NOZZLE ASSEMBLY TO HOSE ASSEMBLY

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Failure to comply could result in injury or death to personnel.

CANNOT CONNECT NOZZLE ASSEMBLY TO HOSE ASSEMBLY - Continued

STEP

1. Confirm that nozzle assembly (Figure 1, Item 1) cannot be connected to hose assembly.

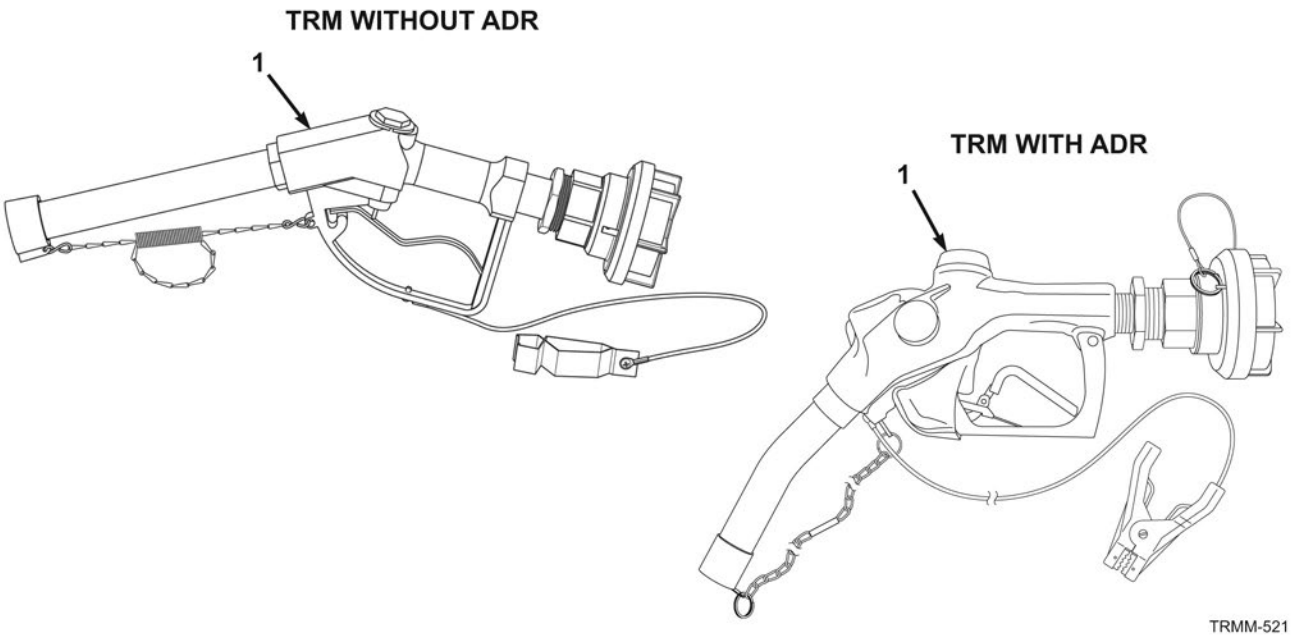


Figure 1. Nozzle Assembly.

CONDITION/INDICATION

Is fault confirmed?

DECISION

YES - Proceed to Malfunction: Nozzle assembly faulty.
NO - Return nozzle assembly to service.

MALFUNCTION

Nozzle assembly faulty

ACTION

1. Repair nozzle assembly (WP 0125).
2. Return MFS TRM to service if condition is fixed.

END OF WORK PACKAGE

MAINTAINER TROUBLESHOOTING
CANNOT CONNECT COMPONENTS TO QUICK DISCONNECT REDUCER, OR QUICK DISCONNECT COUPLING HALF TROUBLESHOOTING PROCEDURE

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposible nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)

Materials/Parts
- Absorbent material (WP 0216, Table 1, Item 1)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer

References
- ATP 4-43
- TM 10-4930-371-10

Equipment Condition
- MFS TRM grounded (TM 10-4930-371-10)
- MFS TRM set on level ground (TM 10-4930-371-10)

Time to Complete
- 0.2 Hour(s)

GENERAL

This work package contains Maintainer troubleshooting procedures for MFS TRM. Use this work package to help isolate and correct system problems. Ensure all operator PMCS and troubleshooting procedures have been performed.

TROUBLESHOOTING PROCEDURE

CANNOT CONNECT COMPONENTS TO QUICK DISCONNECT REDUCER, OR QUICK DISCONNECT COUPLING HALF

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Failure to comply could result in injury or death to personnel.

STEP

1. Confirm that quick disconnect reducer (Figure 1, Item 1) or quick disconnect coupling half (Figure 1, Item 2) cannot be connected to other components.

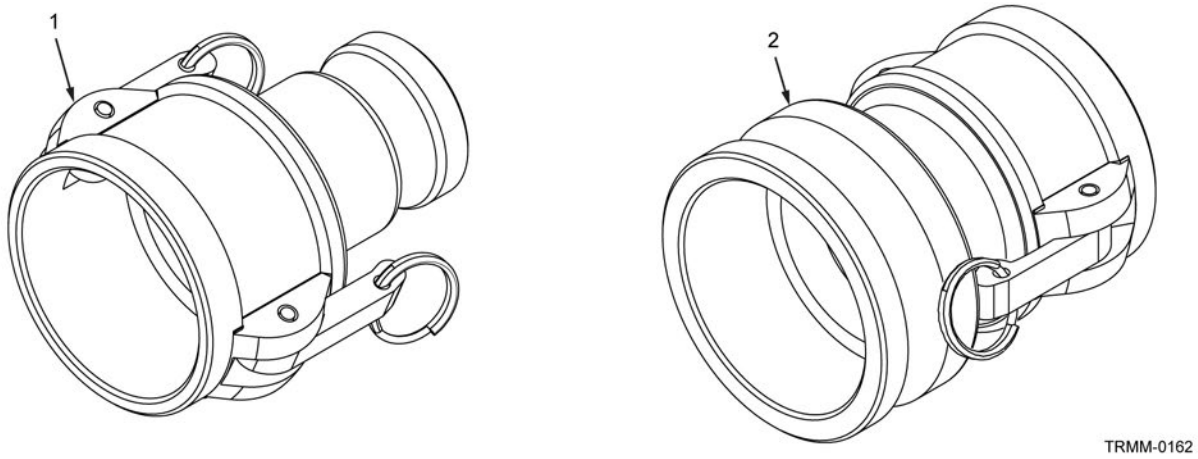


Figure 1. Quick Disconnect Reducer and Quick Disconnect Coupling Half.

CONDITION/INDICATION

Is fault confirmed?

CANNOT CONNECT COMPONENTS TO QUICK DISCONNECT REDUCER, OR QUICK DISCONNECT COUPLING HALF - Continued

DECISION

YES - Proceed to Malfunction: Item faulty.
NO - Return item to service.

MALFUNCTION

Item faulty

ACTION

Replace quick disconnect reducer or quick disconnect coupling (TM 10-4930-371-10).

END OF WORK PACKAGE

MAINTAINER TROUBLESHOOTING
CANNOT CONNECT 4-INCH, 2-INCH, OR HEMTT HOSE ASSEMBLY TO COMPONENTS TROUBLESHOOTING PROCEDURE

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposible nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)

Materials/Parts
- Absorbent material (WP 0216, Table 1, Item 1)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer

References
- ATP 4-43
- WP 0196
- WP 0197
- WP 0198

Equipment Condition
- MFS TRM grounded (TM 10-4930-371-10)
- MFS TRM set on level ground (TM 10-4930-371-10)

Time to Complete
- 0.5 Hour(s)

GENERAL

This work package contains Maintainer troubleshooting procedures for MFS TRM. Use this work package to help isolate and correct system problems. Ensure all operator PMCS and troubleshooting procedures have been performed.

TROUBLESHOOTING PROCEDURE

CANNOT CONNECT 4-INCH, 2-INCH, OR HEMTT HOSE ASSEMBLY TO COMPONENTS

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Failure to comply could result in injury or death to personnel.

CANNOT CONNECT 4-INCH, 2-INCH, OR HEMTT HOSE ASSEMBLY TO COMPONENTS - Continued

STEP

1. Confirm that 4-inch, 2-inch, or HEMTT hose assembly (Figure 1, Item 1, 2, or 3) cannot be connected to other components.

CONDITION/INDICATION

Is fault confirmed?

DECISION

YES - Proceed to Malfunction: 4-inch, 2-inch, or HEMTT hose assembly faulty.
NO - Return hose assembly to service.

MALFUNCTION

4-Inch, 2-Inch, or HEMTT hose assembly faulty

ACTION

Refer to the appropriate work package for:

HEMTT hose (WP 0196)

2-inch hose (WP 0197)

4-inch hose (WP 0198)

CANNOT CONNECT 4-INCH, 2-INCH, OR HEMTT HOSE ASSEMBLY TO COMPONENTS - Continued

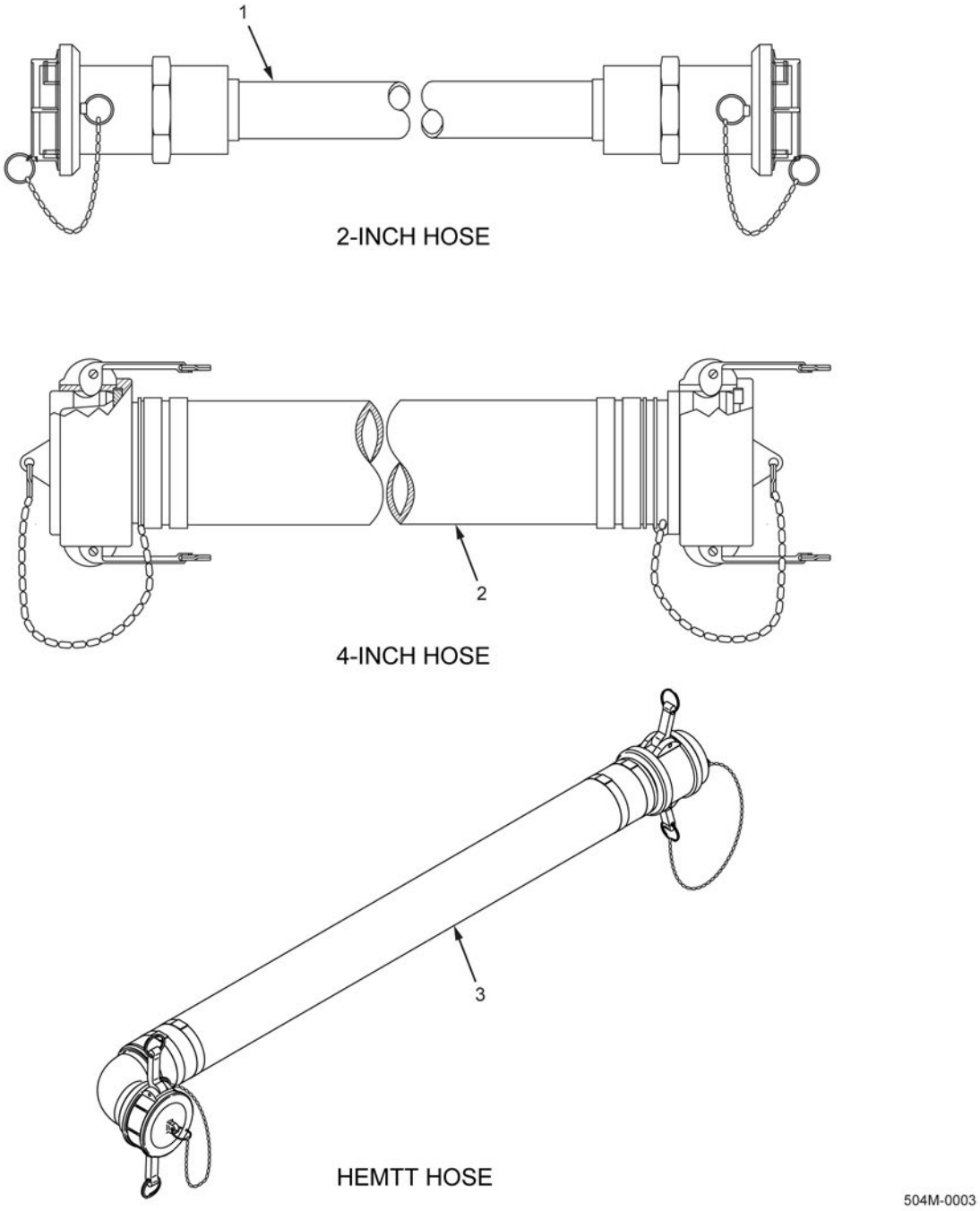


Figure 1. 4-Inch, 2-Inch, or HEMTT Hoses.

END OF WORK PACKAGE

MAINTAINER TROUBLESHOOTING
CANNOT CONNECT REMOTE CONTROL ASSEMBLY TO POWER CONTROL BOX TROUBLESHOOTING PROCEDURE

INITIAL SETUP:

Tools and Special Tools
Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
Fire extinguisher (TM 10-4930-371-10)

Personnel Required
91J Quartermaster and Chemical Equipment Repairer

References
TM 10-4930-371-10
WP 0117

Equipment Condition
MFS TRM prepared for use (TM 10-4930-371-10)

Time to Complete
0.2 Hour(s)

GENERAL

This work package contains Maintainer troubleshooting procedures for MFS TRM. Use this work package to help isolate and correct system problems. Ensure all operator PMCS and troubleshooting procedures have been performed.

TROUBLESHOOTING PROCEDURE

CANNOT CONNECT REMOTE CONTROL ASSEMBLY TO POWER CONTROL BOX

STEP

1. Check remote control switch connector for serviceability as follows:
   a. Check connector shell (Figure 1, Item 3) and body for damage, warping, bending, or other defects that would prevent it from connecting to power control box.
   b. Check alignment lugs (Figure 1, Item 2) for damage that would prevent the connector from connecting to power control box.
   c. Check pins (Figure 1, Item 1) and ensure they are not bent or otherwise damaged.
   d. Check strain relief (Figure 1, Item 4) for damage including exposed wires.

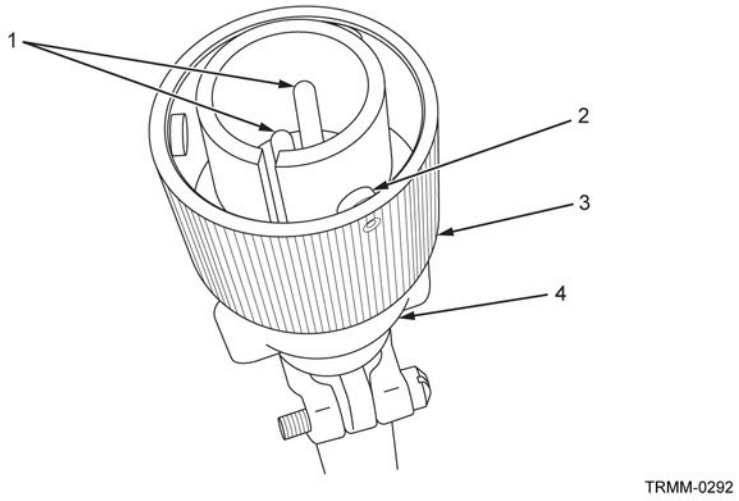


Figure 1. Remote Control Switch Connector.

CONDITION/INDICATION

Is remote control connector (Figure 1) damaged?

DECISION

YES - Proceed to Malfunction: Remote control switch connector faulty.
NO - Proceed to Step 2.

MALFUNCTION

Remote control switch connector faulty

ACTION

1. Replace remote control switch assembly (TM 10-4930-371-10).
2. Verify condition is fixed by connecting replacement remote control switch connector (Figure 2, Item 2) to remote connector (Figure 2, Item 1).
3. Continue fueling operations if condition is fixed.

CANNOT CONNECT REMOTE CONTROL ASSEMBLY TO POWER CONTROL BOX - Continued

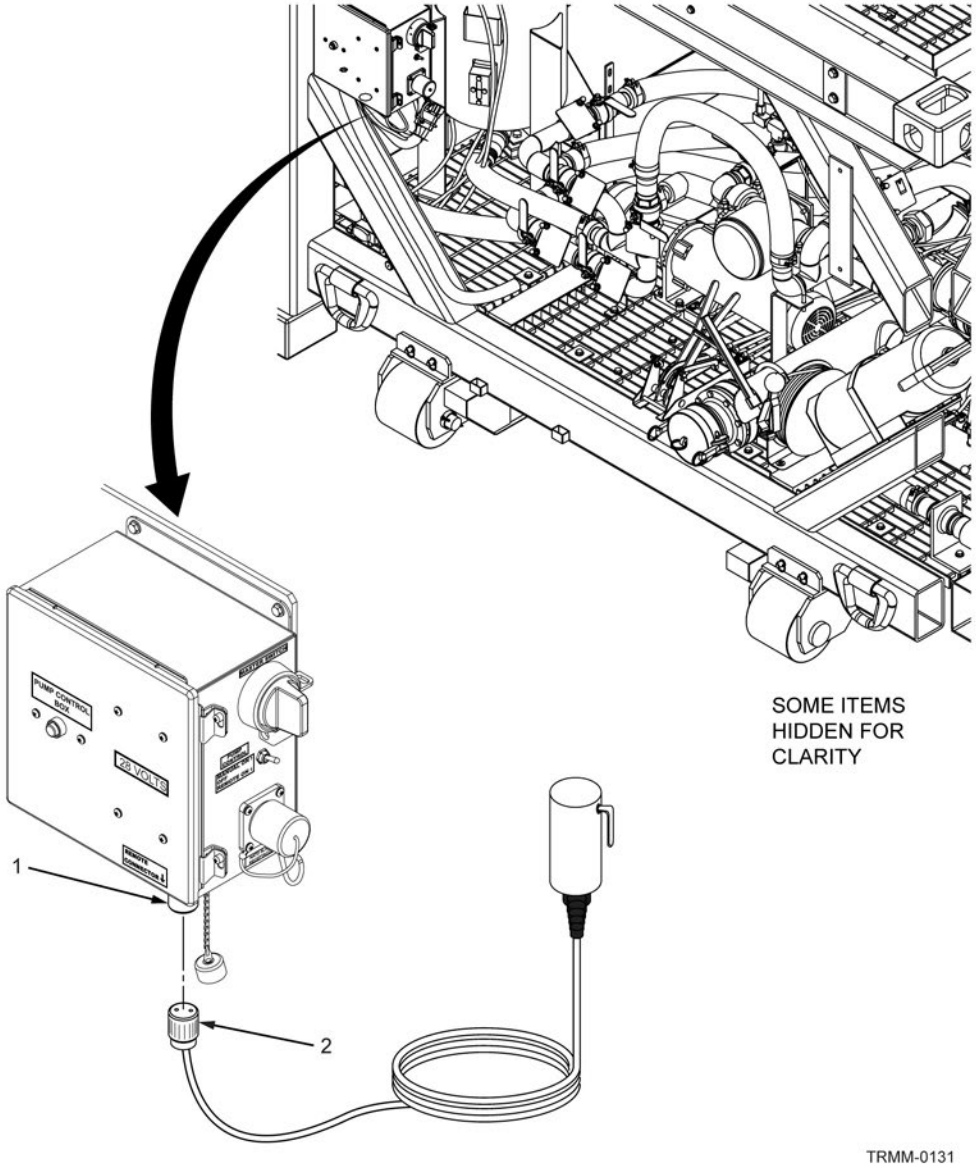


Figure 2. Connecting Remote Control Switch to Remote Connector.

CANNOT CONNECT REMOTE CONTROL ASSEMBLY TO POWER CONTROL BOX - Continued

STEP

2. Check remote connector for serviceability as follows:
   a. Check remote connector body (Figure 3, Item 3) for damage, warping, bending, or other defects that would prevent it from connecting to remote control switch connector.
   b. Check remote connector sockets (Figure 3, Item 1) and ensure they are clear of obstructions and not damaged.
   c. Check for presence and serviceability of dust cap (Figure 3, Item 2).

CONDITION/INDICATION

Is remote connector (Figure 3) unserviceable?

DECISION

YES - Proceed to Malfunction: Remote connector faulty.
NO - Return MFS TRM to service.

MALFUNCTION

Remote connector faulty

ACTION

1. Replace remote connector (WP 0117).
2. Verify condition is fixed.
3. Continue fueling operations if condition is fixed.

CANNOT CONNECT REMOTE CONTROL ASSEMBLY TO POWER CONTROL BOX - Continued

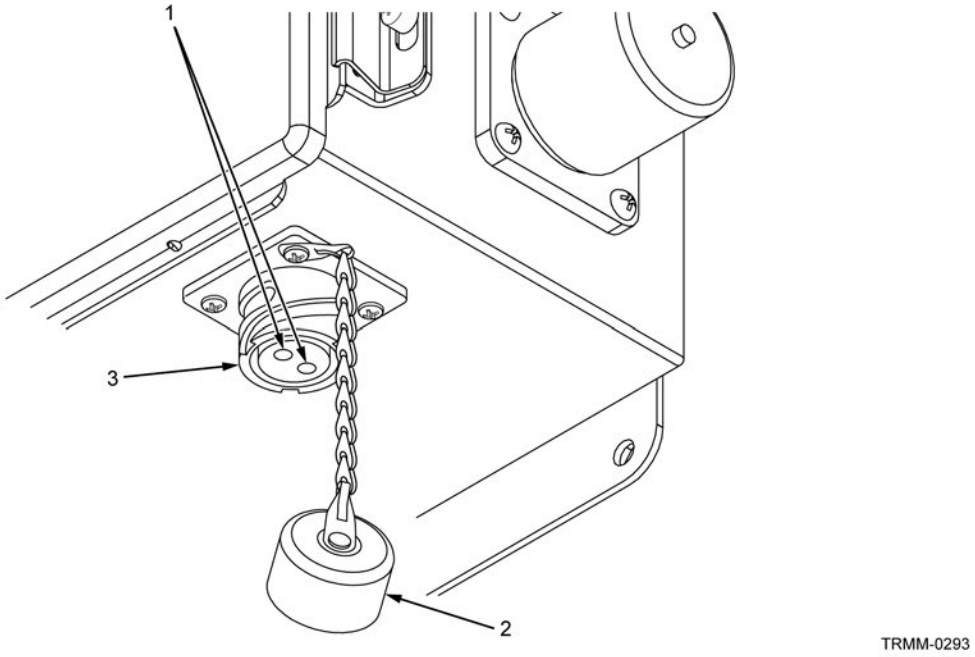


Figure 3. Remote Connector Components.

END OF WORK PACKAGE

MAINTAINER TROUBLESHOOTING
VALVE CONTROL LEVERS DO NOT FULLY OPEN/CLOSE BOTTOM LOADING VALVE (V1) OR TANK DISCHARGE VALVE (V2) TROUBLESHOOTING PROCEDURE

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposible nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer (2)

References
- TM 10-4930-371-10
- WP 0049
- WP 0050

References (cont.)
- WP 0051
- WP 0073
- WP 0075

Equipment Condition
- MFS TRM grounded (TM 10-4930-371-10)
- MFS TRM loaded on PLS trailer (TM 10-4930-371-10)
- MFS TRM ladder platform emplaced (TM 10-4930-371-10)
- MFS TRM ladder emplaced (TM 10-4930-371-10)

Time to Complete
- 1.5 Hour(s)

GENERAL

This work package contains Maintainer troubleshooting procedures for MFS TRM. Use this work package to help isolate and correct system problems. Ensure all operator PMCS and troubleshooting procedures have been performed.

TROUBLESHOOTING PROCEDURE

VALVE CONTROL LEVERS DO NOT FULLY OPEN/CLOSE BOTTOM LOADING VALVE (V1) OR TANK DISCHARGE VALVE (V2)

WARNING

- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the Modular Fuel System Tank Rack Module (MFS TRM) prior to the transfer of fuel.
- Failure to comply could result in injury or death to personnel.

VALVE CONTROL LEVERS DO NOT FULLY OPEN/CLOSE BOTTOM LOADING VALVE (V1) OR TANK DISCHARGE VALVE (V2) - Continued

STEP

1. While observing bottom loading valve (V1) (Figure 1, Item 1) or tank discharge valve (V2) (Figure 1, Item 2) as applicable, open and close it using control lever (Figure 1, Item 3).

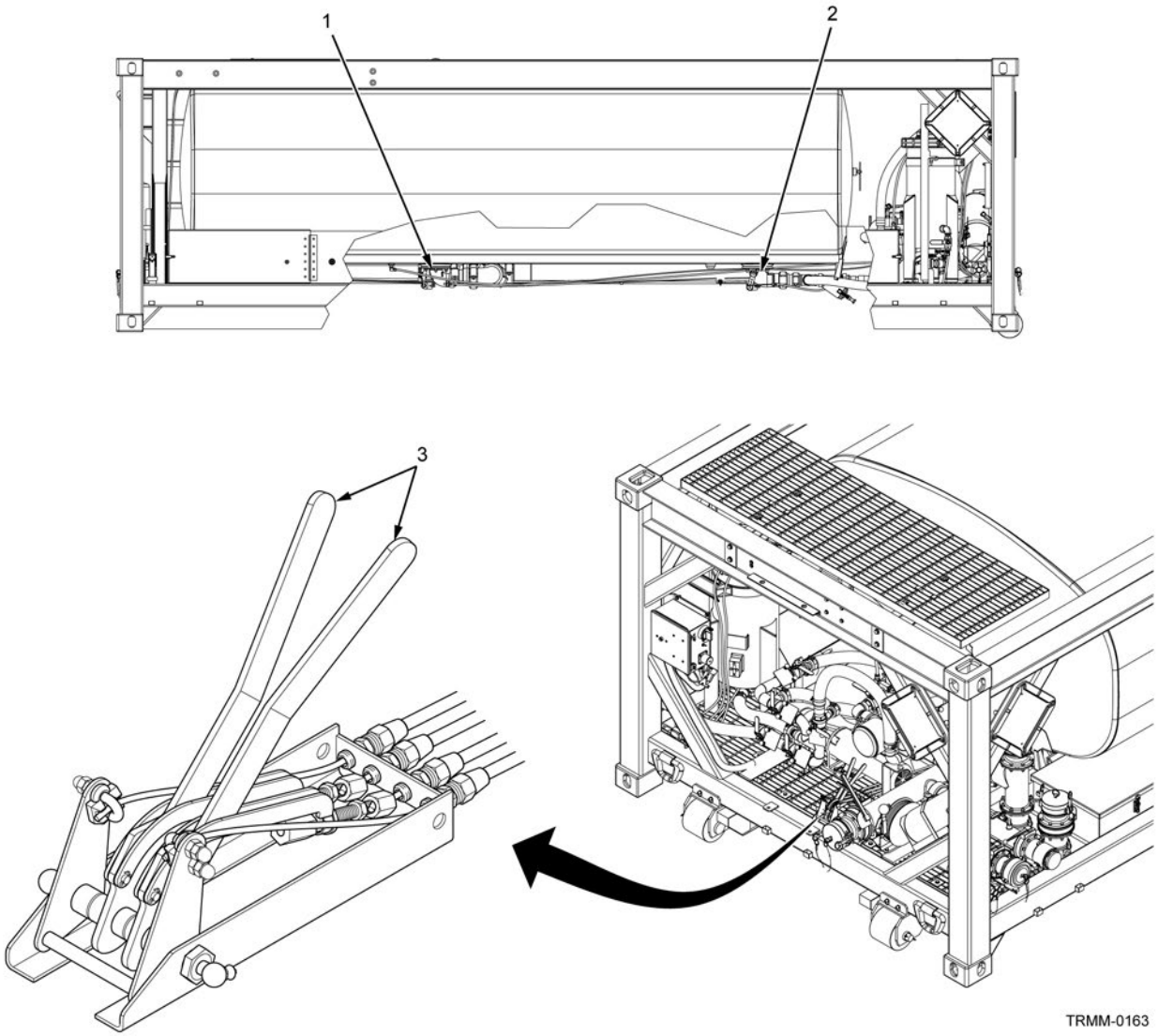


Figure 1. Bottom Loading Valve (V1) and Tank Discharge Valve (V2) Operation.

CONDITION/INDICATION

Does control lever (Figure 1, Item 3) have too much slack to operate bottom loading valve (V1) (Figure 1, Item 1) or tank discharge valve (V2) (Figure 1, Item 2)?

DECISION

YES - Proceed to Malfunction: Control cable out of adjustment.
NO - Proceed to Step 2.

VALVE CONTROL LEVERS DO NOT FULLY OPEN/CLOSE BOTTOM LOADING VALVE (V1) OR TANK DISCHARGE VALVE (V2) - Continued

MALFUNCTION

Control cable out of adjustment

ACTION

1. Adjust control cable (WP 0073).
2. Verify condition is fixed by placing MFS TRM in recirculation mode (TM 10-4930-371-10).
3. Continue fueling operations if condition is fixed.

STEP

2. While observing bottom loading valve (V1) (Figure 1, Item 1) or tank discharge valve (V2) (Figure 1, Item 2) as applicable, open and close it using control lever (Figure 1, Item 3).

CONDITION/INDICATION

Does control lever (Figure 2, Item 4) move, but valve linkage does not move?

VALVE CONTROL LEVERS DO NOT FULLY OPEN/CLOSE BOTTOM LOADING VALVE (V1) OR TANK DISCHARGE VALVE (V2) - Continued

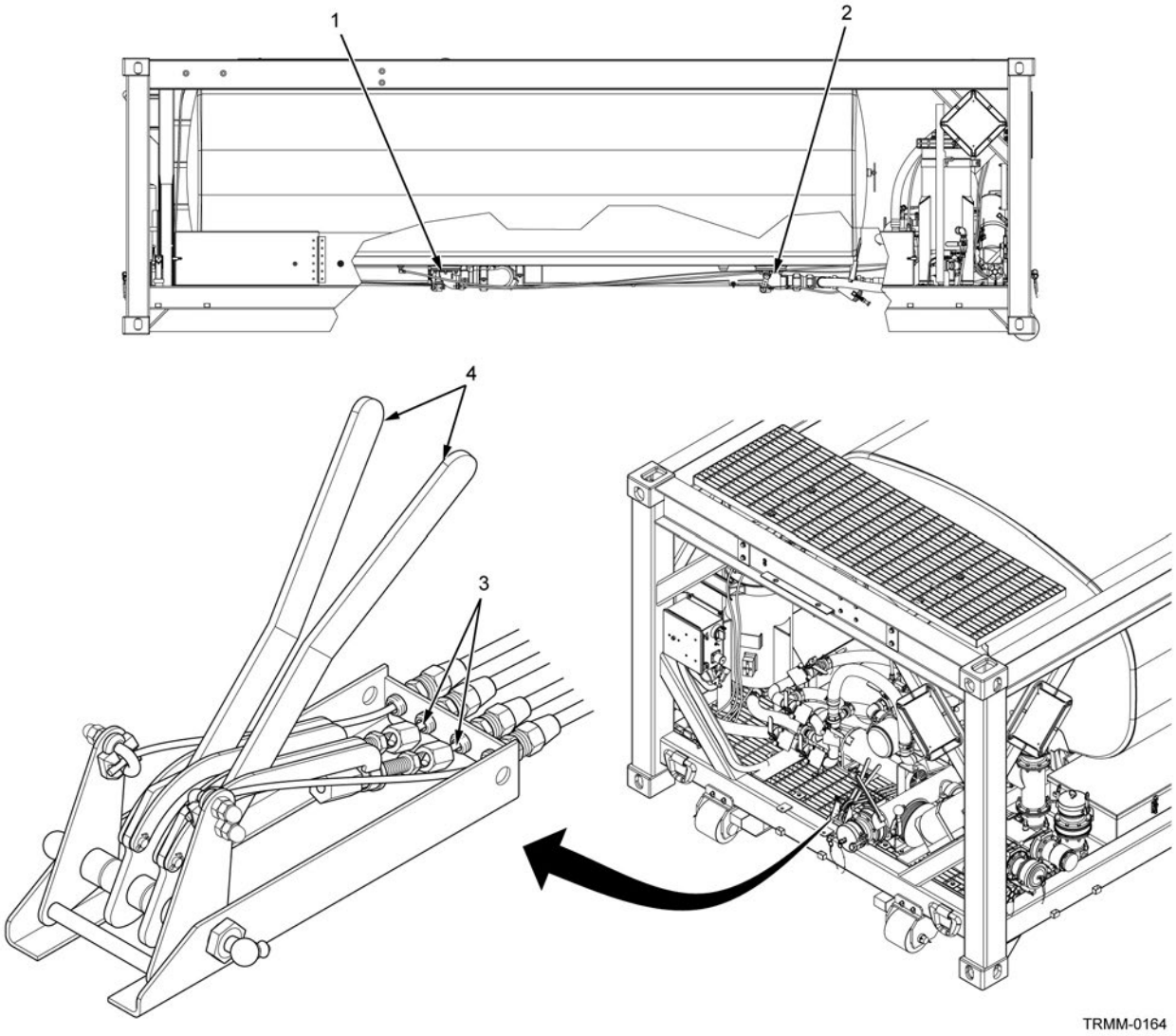


Figure 2. Bottom Loading Valve (V1) and Tank Discharge Valve (V2) Operation.

DECISION

YES - Proceed to Malfunction: Fusible link or control cable faulty.
NO - Proceed to Step 3.

MALFUNCTION

Control cable or fusible link faulty

ACTION

1. Inspect fusible link (Figure 3, Items 1 or 2) for damage.

VALVE CONTROL LEVERS DO NOT FULLY OPEN/CLOSE BOTTOM LOADING VALVE (V1) OR TANK DISCHARGE VALVE (V2) - Continued

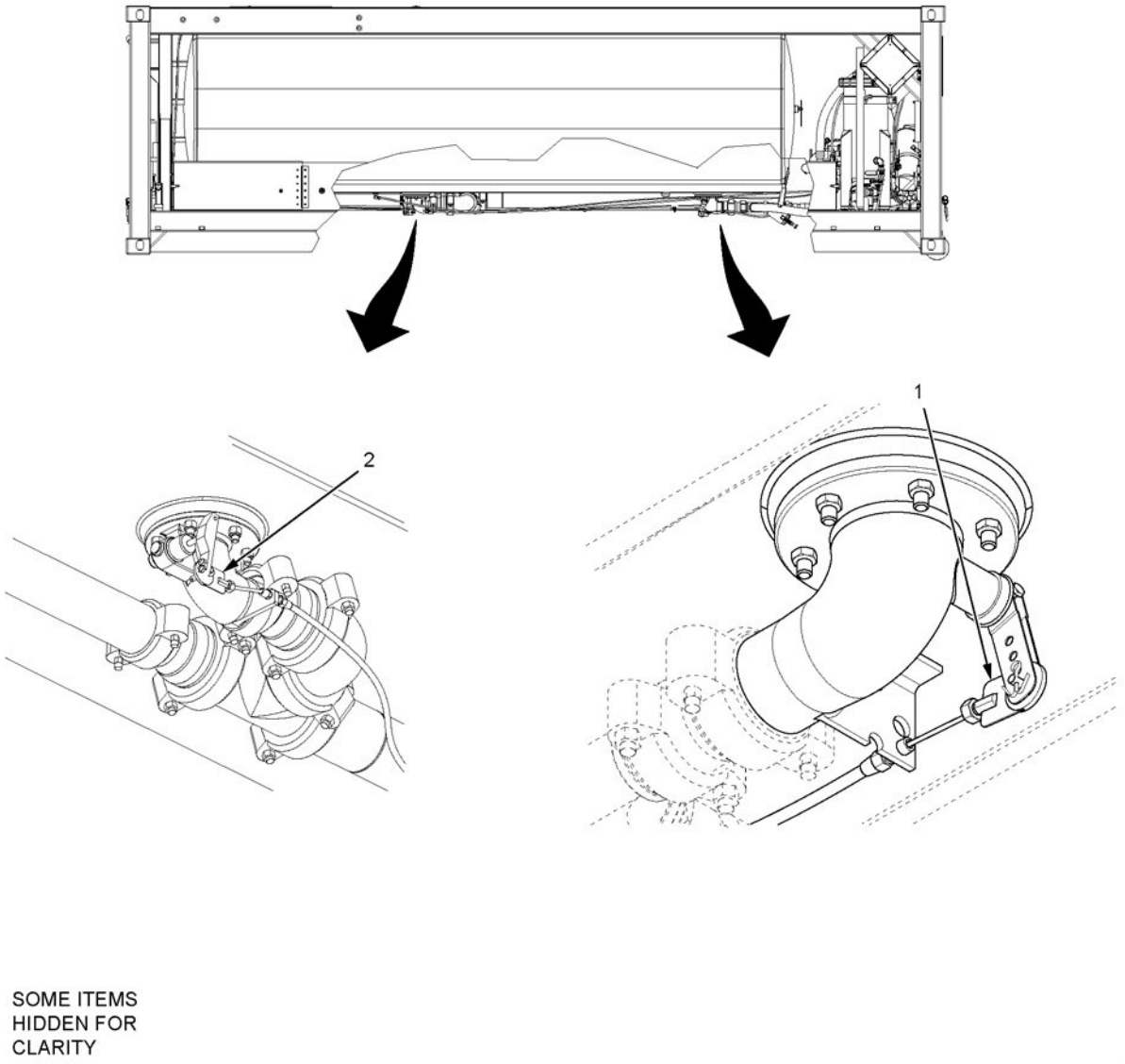


Figure 3. Bottom Loading Valve (V1) and Tank Discharge Valve (V2) Fusible Links.

2. Inspect control cable for damage.
3. Refer to appropriate work package and remove and replace damaged component:
   a. Fusible link (WP 0051)

VALVE CONTROL LEVERS DO NOT FULLY OPEN/CLOSE BOTTOM LOADING VALVE (V1) OR TANK DISCHARGE VALVE (V2) - Continued

b. Control cable replacement (WP 0075)

4. Verify condition is fixed by placing MFS TRM in recirculation mode (TM 10-4930-371-10).
5. Continue fueling operations if condition is fixed.

STEP

3. While observing bottom loading valve (V1) (Figure 1, Item 1) or tank discharge valve (V2) (Figure 1, Item 2) as applicable, open and close it using control lever (Figure 1, Item 3).

CONDITION/INDICATION

Does control cable (Figure 2, Item 3) appear intact, but valve linkage does not move?

DECISION

YES - Proceed to Malfunction: Bottom loading valve (V1) or tank discharge valve (V2) faulty.
NO - Return to Step 1 and reverify fault.

MALFUNCTION

Bottom loading valve (V1) or tank discharge valve (V2) faulty

ACTION

1. Replace bottom loading valve (V1) (WP 0049) or tank discharge valve (V2) (WP 0050), as applicable.
2. Verify condition is fixed by placing MFS TRM in recirculation mode (TM 10-4930-371-10).
3. Continue fueling operations if condition is fixed.

END OF WORK PACKAGE

MAINTAINER TROUBLESHOOTING
PORT CONTROL BUTTERFLY VALVES (V3, V4, OR V6) DO NOT FULLY OPEN/CLOSE TROUBLESHOOTING PROCEDURE

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposible nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)
- Pan, drip (WP 0217, Table 1, Item 8)

Materials/Parts
- Absorbent material (WP 0216, Table 1, Item 1)
- Cloth, cleaning (WP 0216, Table 1, Item 4)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer

References
- ATP 4-43
- TM 10-4930-371-10
- WP 0090
- WP 0091
- WP 0093

Equipment Condition
- MFS TRM on ground (TM 10-4930-371-10)
- MFS TRM shut down (TM 10-4930-371-10)
- MFS TRM piping manifold evacuated (TM 10-4930-371-10)

Time to Complete
- 0.5 Hour(s)

GENERAL

This work package contains Maintainer troubleshooting procedures for MFS TRM. Use this work package to help isolate and correct system problems. Ensure all operator PMCS and troubleshooting procedures have been performed.

TROUBLESHOOTING PROCEDURE

PORT CONTROL BUTTERFLY VALVES (V3, V4, or V6) DO NOT FULLY OPEN/CLOSE

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Failure to comply could result in injury or death to personnel.

STEP

1. Place a drip pan to catch residual fuel, under port control butterfly valve (Figure 1) to be checked.
2. Remove dust cap or dust plug from port G, B or C (Figure 1).
3. Inspect inside of port control butterfly valve (V3, V4 or V6) (Figure 1) for debris.

PORT CONTROL BUTTERFLY VALVES (V3, V4, or V6) DO NOT FULLY OPEN/CLOSE - Continued

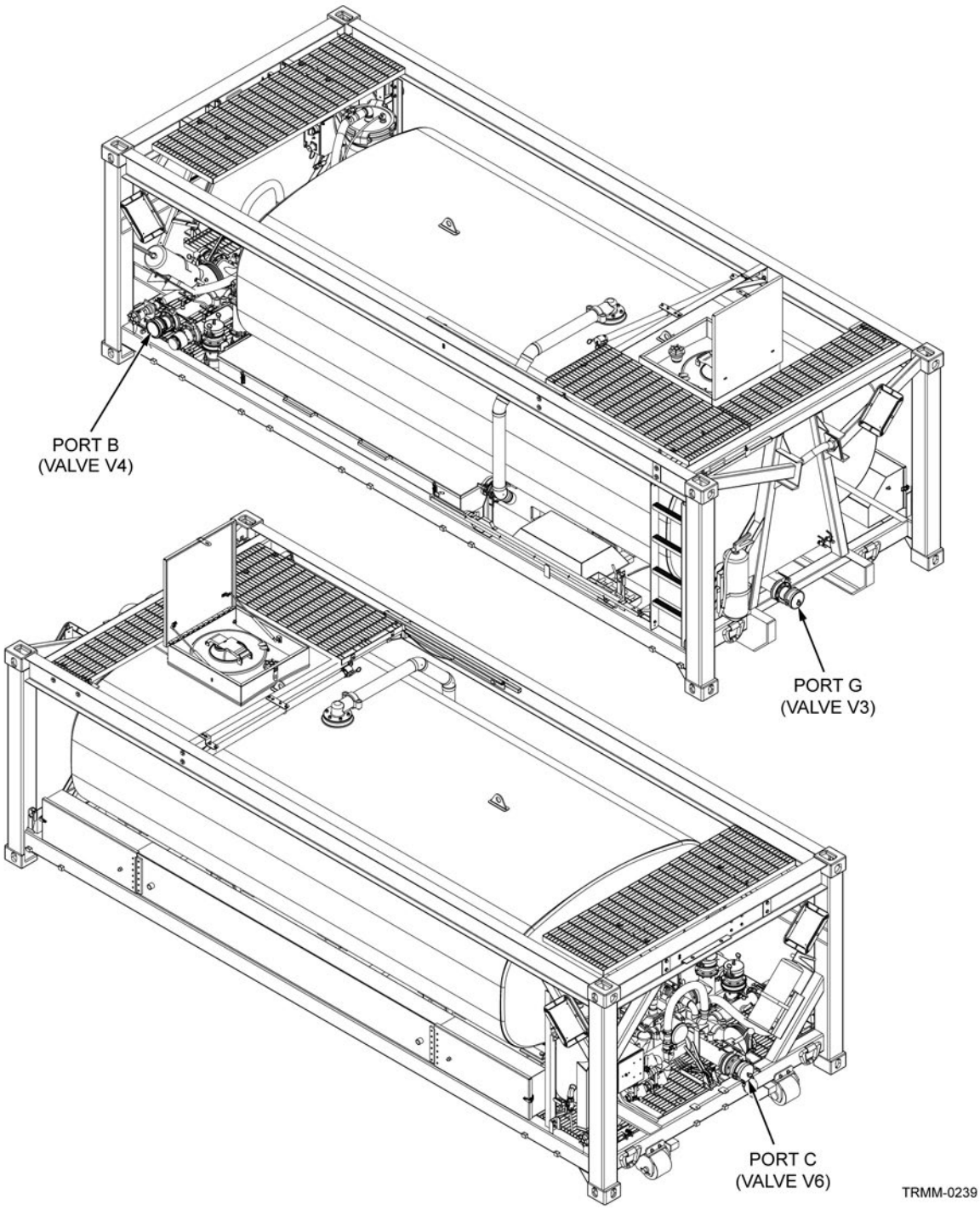


Figure 1. MFS TRM Port Control Valves.

CONDITION/INDICATION

Is debris present inside port control butterfly valve?

PORT CONTROL BUTTERFLY VALVES (V3, V4, or V6) DO NOT FULLY OPEN/CLOSE - Continued

DECISION

YES - Proceed to Malfunction: Port control butterfly valve dirty.
NO - Proceed to Malfunction: Port control butterfly valve faulty.

MALFUNCTION

Port control butterfly valve dirty

ACTION

1. Clean inside of port control butterfly valve.
2. Verify condition is fixed by fully opening and fully closing butterfly valve.
3. If condition still exists, proceed to Malfunction: Port control butterfly valve faulty.
4. Continue fueling operations if condition is fixed.

MALFUNCTION

Port control butterfly valve faulty

ACTION

1. Refer to appropriate work package and replace port control butterfly valve:
   Port G (V3) (WP 0091)
   Port B (V4) (WP 0090)
   Port C (V6) (WP 0093)
2. Verify condition is fixed by loading fuel into MFS TRM and performing pumping operations using the affected port control valve (TM 10-4930-371-10) and observing for leaks.
3. Continue fueling operations if condition is fixed.

END OF WORK PACKAGE

MAINTAINER TROUBLESHOOTING
VALVED DRY BREAK COUPLING VALVES (V7, V8, OR V17) DO NOT FULLY OPEN/CLOSE TROUBLESHOOTING PROCEDURE

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposible nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)
- Pan, drip (WP 0217, Table 1, Item 8)

Materials/Parts
- Absorbent material (WP 0216, Table 1, Item 1)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer

References
- ATP 4-43

References (cont.)
- WP 0059
- WP 0095

Equipment Condition
- MFS TRM grounded (TM 10-4930-371-10)
- MFS TRM shut down (TM 10-4930-371-10)
- MFS TRM piping manifold evacuated (TM 10-4930-371-10)

Time to Complete
- 0.2 Hour(s)

GENERAL

This work package contains Maintainer troubleshooting procedures for MFS TRM. Use this work package to help isolate and correct system problems. Ensure all operator PMCS and troubleshooting procedures have been performed.

TROUBLESHOOTING PROCEDURE

VALVED DRY BREAK COUPLING VALVES (V7, V8, OR V17) DO NOT FULLY OPEN/CLOSE

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Failure to comply could result in injury or death to personnel.

STEP

1. Place a drip pan under port (Figure 1) to be checked.
2. Confirm that dry break connectors (Figure 1, Items 1, 2, and 3) cannot be fully opened/closed.

CONDITION/INDICATION

Is fault confirmed?

DECISION

YES - Proceed to Malfunction: Valved dry break coupling faulty.
NO - Return MFS TRM to service.

MALFUNCTION

Valved dry break coupling faulty

ACTION

1. Replace valved dry break coupling:

   Port D/E (V7/V8) valved drybreak coupling (WP 0095)

   Port F (V17) valved drybreak coupling (WP 0059)

2. Return MFS TRM to service if condition is fixed.

VALVED DRY BREAK COUPLING VALVES (V7, V8, OR V17) DO NOT FULLY OPEN/CLOSE - Continued

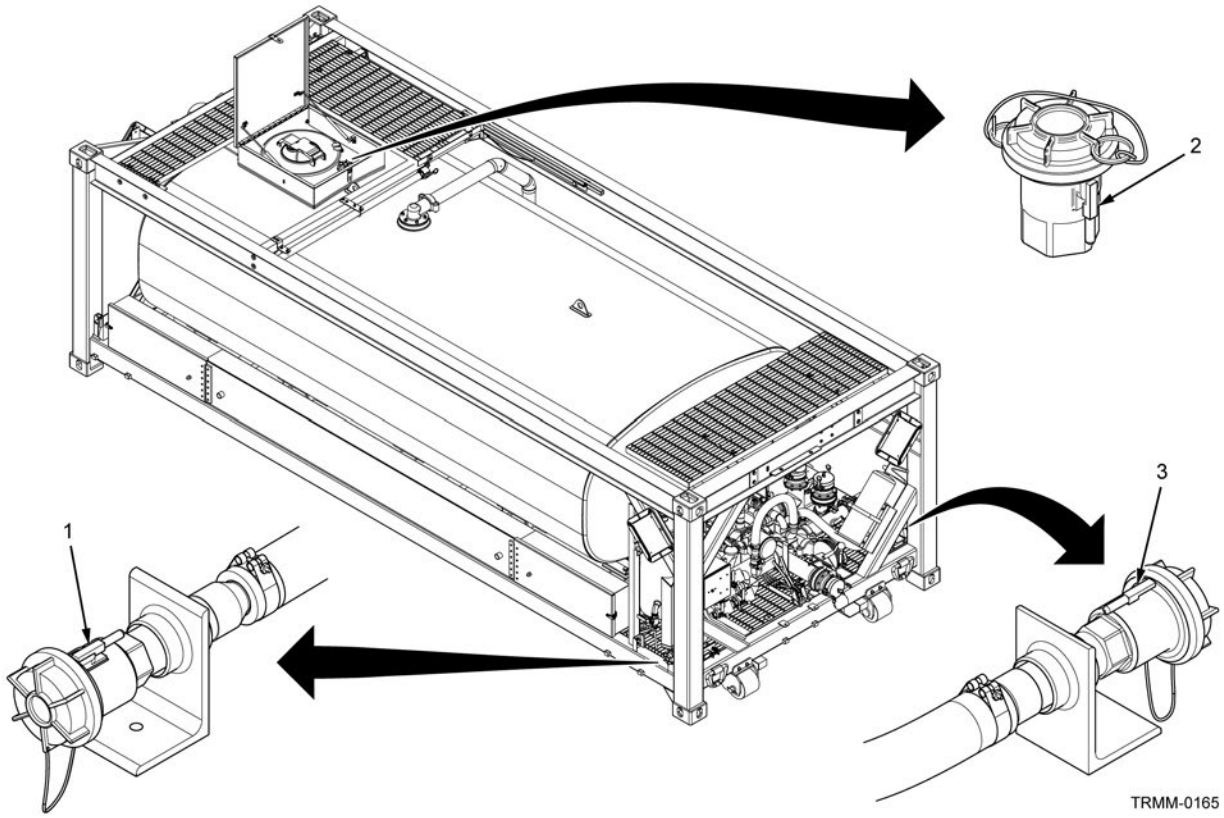


Figure 1. Port D/E (V7/V8) and Port F (V17) Valved Dry Break Coupling.

END OF WORK PACKAGE

MAINTAINER TROUBLESHOOTING
FUEL DOES NOT FLOW OR DECREASE IN FLOW PRESSURE INTO TANK VIA PORTS A, B, OR G DURING BOTTOM LOAD OPERATIONS TROUBLESHOOTING PROCEDURE

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposible nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer

References
- ATP 4-43
- TM 10-4930-371-10
- WP 0144.2

Equipment Condition
- MFS TRM prepared for use (TM 10-4930-371-10)

Time to Complete
- 0.5 Hour(s)

GENERAL

This work package contains Maintainer troubleshooting procedures for MFS TRM. Use this work package to help isolate and correct system problems. Ensure all operator PMCS and troubleshooting procedures have been performed.

TROUBLESHOOTING PROCEDURE

FUEL DOES NOT FLOW OR DECREASE IN FLOW PRESSURE INTO TANK VIA PORTS A, B, OR G DURING BOTTOM LOAD OPERATIONS

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Failure to comply could result in injury or death to personnel.

FUEL DOES NOT FLOW OR DECREASE IN FLOW PRESSURE INTO TANK VIA PORTS A, B, OR G DURING BOTTOM LOAD OPERATIONS - Continued

NOTE

Ensure corresponding ball valve is in open position (TM 10-4930-371-10).

STEP

Attempt to perform fuel bottom load operations through ports A, B, or G (TM 10-4930-371-10).

CONDITION/INDICATION

Is fuel flow pressure low or is fuel not flowing?

DECISION

YES - Proceed to Malfunction: Air elimination check valve (V19) faulty.
NO - Return TRM with ADR to service.

MALFUNCTION

Air elimination check valve (V19) faulty

ACTION

1. Replace air elimination check valve (V19) (WP 0144.2).
2. Verify condition is fixed by performing fuel operations (TM 10-4930-371-10).
3. Continue fueling operations if condition is fixed.

END OF WORK PACKAGE

MAINTAINER TROUBLESHOOTING
CANNOT FULLY OPEN/CLOSE BALL VALVE ASSEMBLY (V9, V10, V11, V12, V13, V14, V15, V21, OR V22) TROUBLESHOOTING PROCEDURE

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposible nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)

Materials/Parts
- Absorbent material (WP 0216, Table 1, Item 1)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer

References
- ATP 4-43

References (cont.)
- TM 10-4930-371-10
- WP 0085
- WP 0086
- WP 0087
- WP 0088
- WP 0106
- WP 0107
- WP 0144.1
- WP 0144.5

Equipment Condition
- MFS TRM grounded (TM 10-4930-371-10)
- MFS TRM shut down (TM 10-4930-371-10)

Time to Complete
- 0.5 Hour(s)

GENERAL

This work package contains Maintainer troubleshooting procedures for MFS TRM. Use this work package to help isolate and correct system problems. Ensure all operator PMCS and troubleshooting procedures have been performed.

TROUBLESHOOTING PROCEDURE

CANNOT FULLY OPEN/CLOSE BALL VALVE ASSEMBLY (V9, V10, V11, V12, V13, V14, V15, V21, OR V22)

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Failure to comply could result in injury or death to personnel.

STEP

1. Check to see if ball valve (Figure 1) can be fully opened/closed.

CONDITION/INDICATION

Is fault evident?

DECISION

YES - Proceed to Malfunction: Ball valve faulty.
NO - Return MFS TRM to service.

MALFUNCTION

Ball valve faulty

ACTION

1. Refer to appropriate work package and replace faulty ball valve assembly:

Ball valve (V9) (WP 0085)
Ball valve (V10) or (V11) (WP 0086)
Ball valve (V12) (WP 0087)
Ball valve (V13) (WP 0106)
Ball valve (V14) (TRM without ADR) (WP 0107)
Ball valve (V15) (WP 0088)
Ball valve (V14) (TRM with ADR) (WP 0144.5)
Ball valve (V21) (TRM with ADR) (WP 0144.1)
Ball valve (V22) (TRM with ADR) (WP 0144.1)

CANNOT FULLY OPEN/CLOSE BALL VALVE ASSEMBLY (V9, V10, V11, V12, V13, V14, V15, V21, OR V22) - Continued

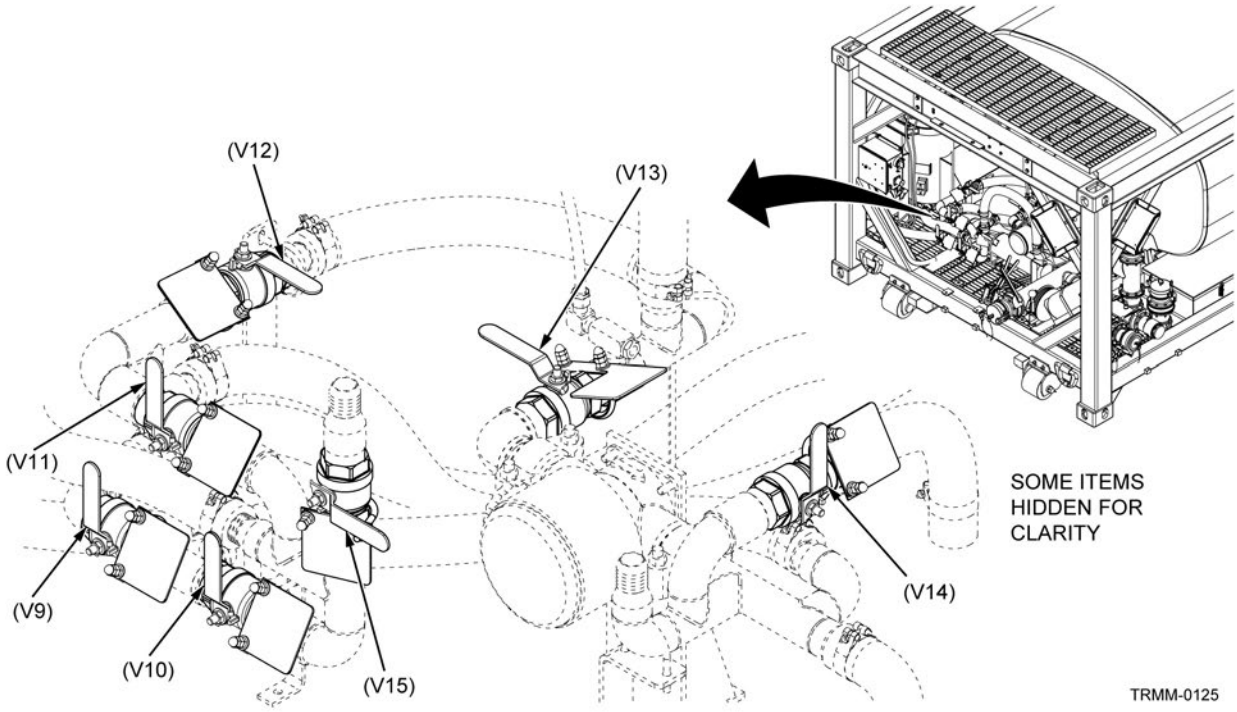


Figure 1. Ball Valve Assemblies.

CANNOT FULLY OPEN/CLOSE BALL VALVE ASSEMBLY (V9, V10, V11, V12, V13, V14, V15, V21, OR V22) - Continued

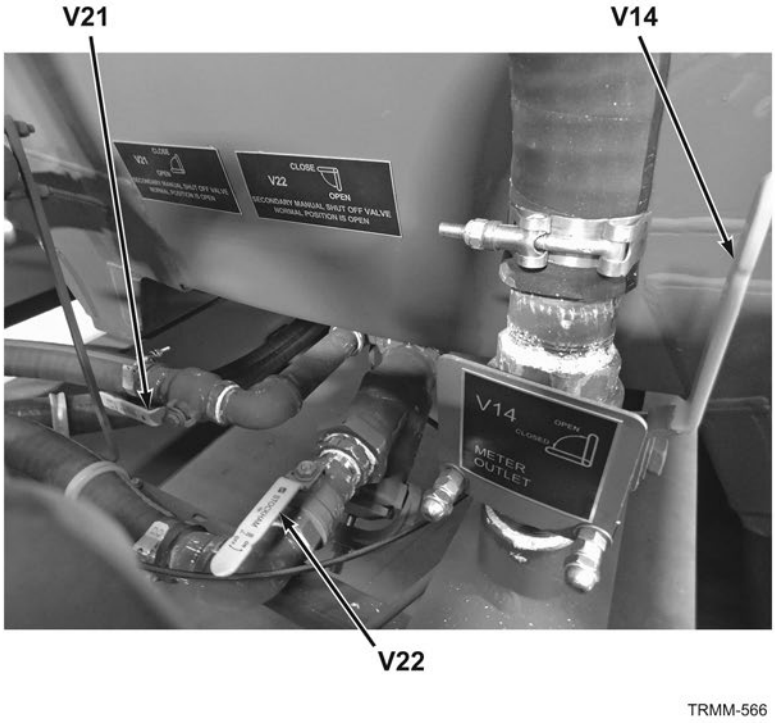


Figure 2. TRM With ADR Ball Valve Assemblies.

2. Verify condition is fixed by loading fuel into MFS TRM and performing pumping operations using the affected port control valve (TM 10-4930-371-10) and observing for leaks.
3. Continue fueling operations if condition is fixed.

END OF WORK PACKAGE

MAINTAINER TROUBLESHOOTING
CANNOT FULLY OPEN/CLOSE PRECHECK VALVE (V16) OR VACUUM BREAKER (VB1)
TROUBLESHOOTING PROCEDURE

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposible nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)

Materials/Parts
- Absorbent material (WP 0216, Table 1, Item 1)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer

References
- ATP 4-43

References (cont.)
- WP 0078
- WP 0108

Equipment Condition
- MFS TRM grounded (TM 10-4930-371-10)
- MFS TRM shut down (TM 10-4930-371-10)

Time to Complete
- 0.2 Hour(s)

GENERAL

This work package contains Maintainer troubleshooting procedures for MFS TRM. Use this work package to help isolate and correct system problems. Ensure all operator PMCS and troubleshooting procedures have been performed.

TROUBLESHOOTING PROCEDURE

CANNOT FULLY OPEN/CLOSE PRECHECK VALVE (V16) OR VACUUM BREAKER (VB1)

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Failure to comply could result in injury or death to personnel.

STEP

1. Check to see if precheck valve (V16) (Figure 1, Item 2) or vacuum breaker (VB1) (Figure 1, Item 1) can be fully opened/closed. For TRM with ADR, check precheck valve (V16) (Figure 1, Item 2) or vacuum breaker (VB1) (Figure 1, Item 1)

CANNOT FULLY OPEN/CLOSE PRECHECK VALVE (V16) OR VACUUM BREAKER (VB1) - Continued

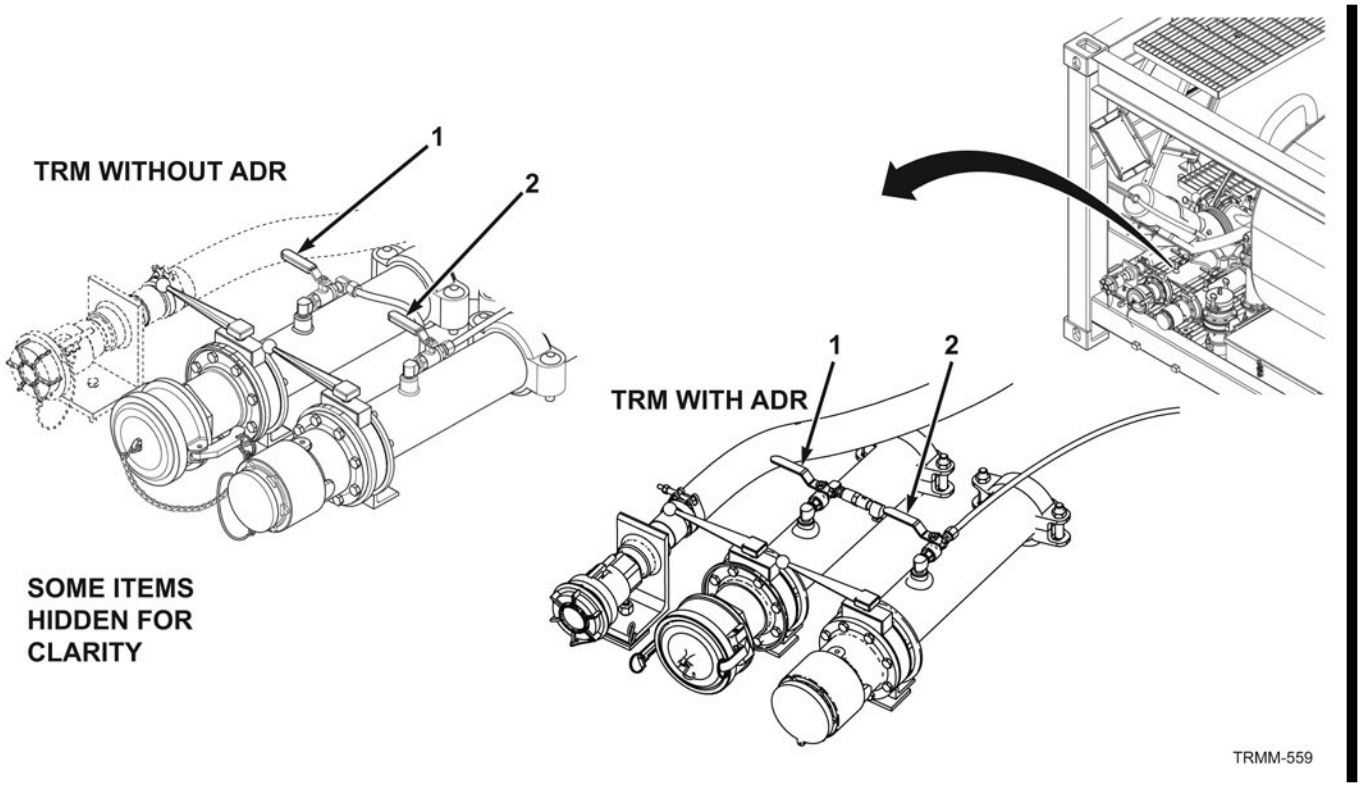


Figure 1. Vacuum Breaker (VB1) and Precheck Valve (V16).

CONDITION/INDICATION

Is fault evident?

DECISION

YES - Proceed to Malfunction: Precheck valve (V16) or vacuum breaker (VB1) faulty.
NO - Return MFS TRM to service.

MALFUNCTION

Precheck valve (V16) or vacuum breaker (VB1) faulty

ACTION

1. Replace precheck valve (V16) (WP 0078) or vacuum breaker (VB1) (WP 0108).
2. Continue fueling operations if condition is fixed.

END OF WORK PACKAGE

MAINTAINER TROUBLESHOOTING
EMERGENCY LEVERS DO NOT CLOSE BOTTOM LOADING VALVE (V1) AND/OR TANK DISCHARGE VALVE (V2) TROUBLESHOOTING PROCEDURE

INITIAL SETUP:

Tools and Special Tools
Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
Fire extinguisher (TM 10-4930-371-10)

Personnel Required
91J Quartermaster and Chemical Equipment Repairer (2)

References
ATP 4-43
WP 0073
WP 0074

References (cont.)
WP 0075
WP 0076
WP 0077

Equipment Condition
MFS TRM shut down (TM 10-4930-371-10)
MFS TRM loaded on PLS trailer (TM 10-4930-371-10)
MFS TRM grounded (TM 10-4930-371-10)

Time to Complete
1.0 Hour(s)

GENERAL

This work package contains Maintainer troubleshooting procedures for MFS TRM. Use this work package to help isolate and correct system problems. Ensure all operator PMCS and troubleshooting procedures have been performed.

TROUBLESHOOTING PROCEDURE

EMERGENCY LEVERS DO NOT CLOSE BOTTOM LOADING VALVE (V1) AND/OR TANK DISCHARGE VALVE (V2)

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Failure to comply could result in injury or death to personnel.

EMERGENCY LEVERS DO NOT CLOSE BOTTOM LOADING VALVE (V1) AND/OR TANK DISCHARGE VALVE (V2) - Continued

STEP

1. Open and close bottom loading valve (V1) (Figure 1, Item 1) and tank discharge valve (V2) (Figure 1, Item 2) using (V1/V2) control lever assembly (Figure 1, Item 3).

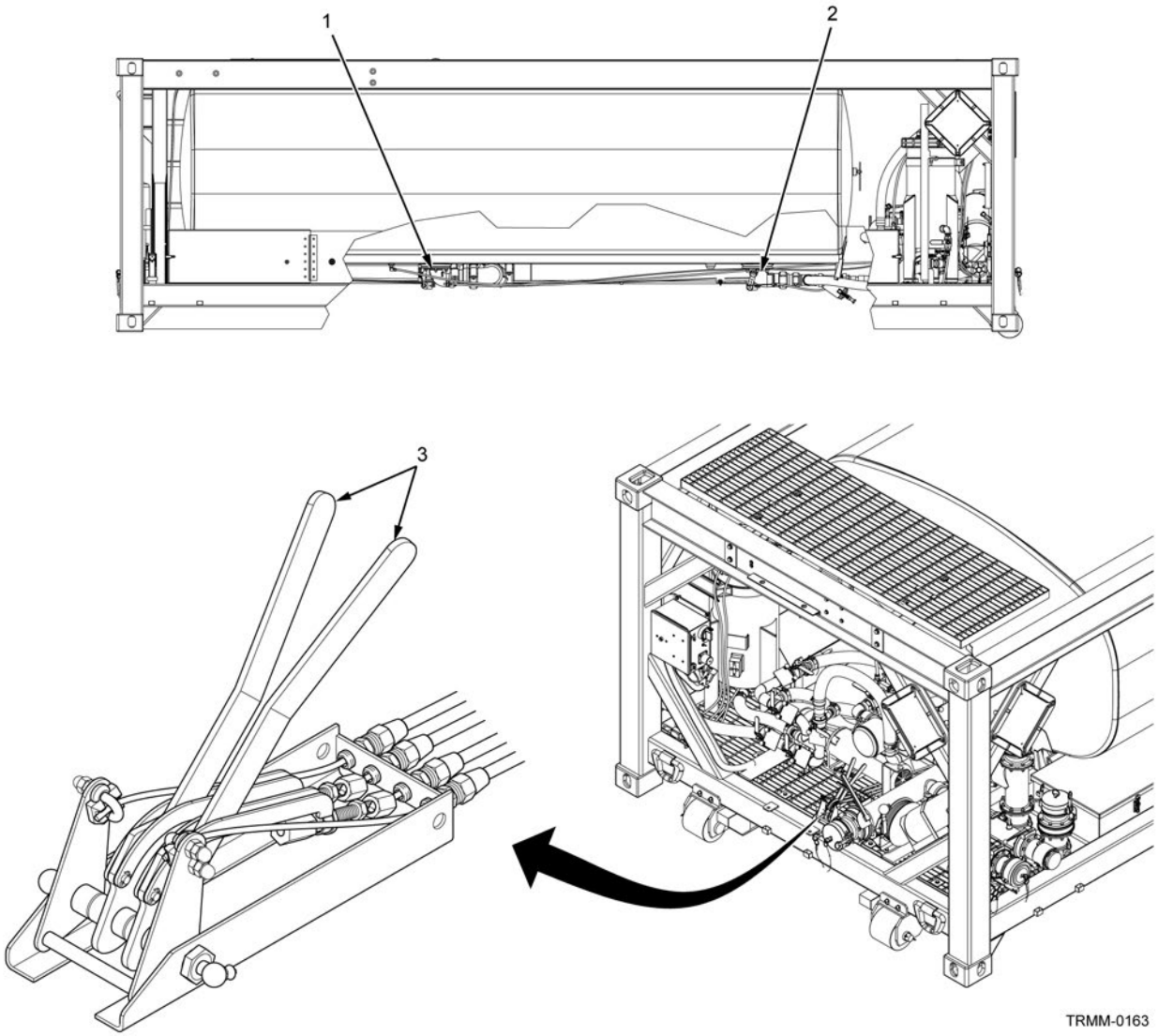


Figure 1. Bottom Loading Valve (V1) and Tank Discharge Valve (V2) Operation.

CONDITION/INDICATION

Does either lever fail to operate normally?

DECISION

YES - Replace control lever assembly (V1/V2) (WP 0074).
NO - Proceed to Step 2.

EMERGENCY LEVERS DO NOT CLOSE BOTTOM LOADING VALVE (V1) AND/OR TANK DISCHARGE VALVE (V2) - Continued

STEP

2. Check condition of emergency lever cables (Figure 2, Items 1 and 2) underneath MFS TRM.

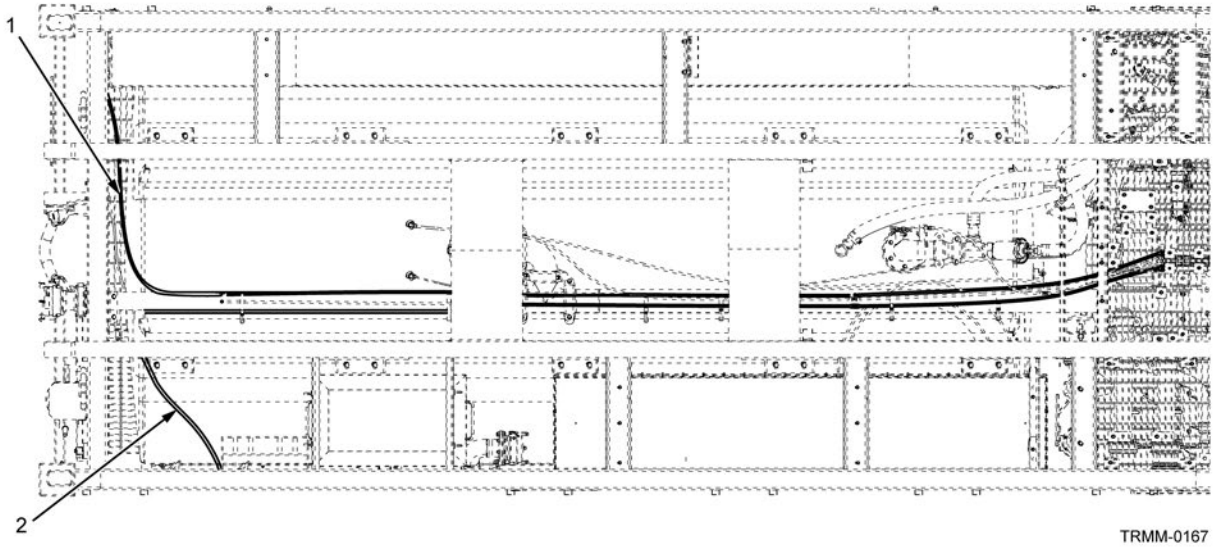


Figure 2. Emergency Lever Cables.

CONDITION/INDICATION

Are there visible signs of damage to the cable and/or tubing that could impair operation?

DECISION

YES - Proceed to Malfunction: Emergency lever cable and/or tubing faulty.
NO - Proceed to Step 3.

MALFUNCTION

Emergency lever cable and/or tubing faulty

ACTION

1. Replace cable (WP 0075) and/or tubing (WP 0077) as required.
2. Verify condition is fixed by completing the following steps:
   a. Open and close bottom loading valve (V1) (Figure 1, Item 1) and tank discharge valve (V2) (Figure 1, Item 2) using (V1/V2) control lever assembly (Figure 1, Item 3).
   b. Activate the left emergency lever (Figure 3, Item 1) and verify that bottom loading valve (V1) (Figure 1, Item 1) and tank discharge valve (V2) (Figure 1, Item 2) close.
   c. Open and close bottom loading valve (V1) (Figure 1, Item 1) and tank discharge valve (V2) (Figure 1, Item 2) using (V1/V2) control lever assembly (Figure 1, Item 3).
   d. Activate the right emergency lever (Figure 3, Item 2) and verify that bottom loading valve (V1) (Figure 1, Item 1) and tank discharge valve (V2) (Figure 1, Item 2) close.

EMERGENCY LEVERS DO NOT CLOSE BOTTOM LOADING VALVE (V1) AND/OR TANK DISCHARGE VALVE (V2) - Continued

3. Continue fueling operations if condition is fixed.

EMERGENCY LEVERS DO NOT CLOSE BOTTOM LOADING VALVE (V1) AND/OR TANK DISCHARGE VALVE (V2) - Continued

STEP

3. Open and close bottom loading valve (V1) (Figure 1, Item 1) and tank discharge valve (V2) (Figure 1, Item 2) using (V1/V2) control lever assembly (Figure 3, Item 3).

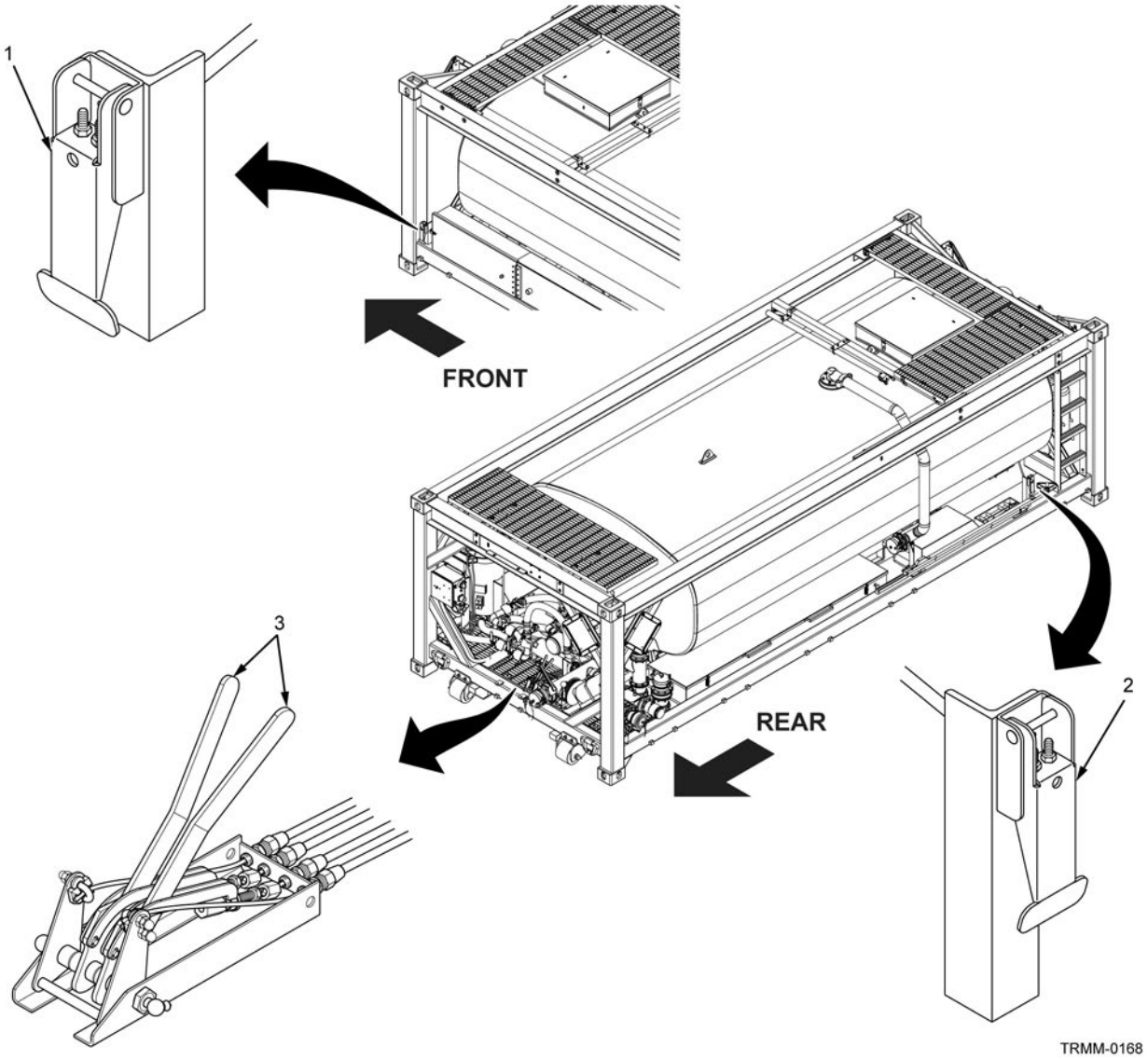


Figure 3. Emergency Lever Operation.

4. Activate the left emergency lever (Figure 3, Item 3) and verify that bottom loading valve (V1) (Figure 1, Item 1) and tank discharge valve (V2) (Figure 1, Item 2) close.
5. Open and close bottom loading valve (V1) (Figure 1, Item 1) and tank discharge valve (V2) (Figure 1, Item 2) using (V1/V2) control lever assembly (Figure 3, Item 3).
6. Activate the right emergency lever (Figure 3, Item 2) and verify that bottom loading valve (V1) (Figure 1, Item 1) and tank discharge valve (V2) (Figure 1, Item 2) close.

EMERGENCY LEVERS DO NOT CLOSE BOTTOM LOADING VALVE (V1) AND/OR TANK DISCHARGE VALVE (V2) - Continued

CONDITION/INDICATION

Does emergency lever cable (Figure 2, Item 1 or 2) move, but fail to close (V1/V2) control lever assembly (Figure 3, Item 3)?

DECISION

YES - Proceed to Malfunction: Emergency lever cable out of adjustment or faulty.
NO - Proceed to Step 7.

MALFUNCTION

Emergency lever cable out of adjustment or faulty

ACTION

1. Adjust emergency lever cable (WP 0073).
2. Verify condition is fixed by completing the following steps:
   a. Open and close bottom loading valve (V1) (Figure 1, Item 1) and tank discharge valve (V2) (Figure 1, Item 2) using (V1/V2) control lever assembly (Figure 1, Item 3).
   b. Activate the left emergency lever (Figure 3, Item 1) and verify that bottom loading valve (V1) (Figure 1, Item 1) and tank discharge valve (V2) (Figure 1, Item 2) close.
   c. Open and close bottom loading valve (V1) (Figure 1, Item 1) and tank discharge valve (V2) (Figure 1, Item 2) using (V1/V2) control lever assembly (Figure 1, Item 3).
   d. Activate the right emergency lever (Figure 3, Item 2) and verify that bottom loading valve (V1) (Figure 1, Item 1) and tank discharge valve (V2) (Figure 1, Item 2) close.
3. Replace cable (WP 0075) and/or tubing (WP 0077) as required.
4. Verify condition is fixed by completing the following steps:
   a. Open and close bottom loading valve (V1) (Figure 1, Item 1) and tank discharge valve (V2) (Figure 1, Item 2) using (V1/V2) control lever assembly (Figure 1, Item 3).
   b. Activate the left emergency lever (Figure 3, Item 1) and verify that bottom loading valve (V1) (Figure 1, Item 1) and tank discharge valve (V2) (Figure 1, Item 2) close.
   c. Open and close bottom loading valve (V1) (Figure 1, Item 1) and tank discharge valve (V2) (Figure 1, Item 2) using (V1/V2) control lever assembly (Figure 1, Item 3).
   d. Activate the right emergency lever (Figure 3, Item 2) and verify that bottom loading valve (V1) (Figure 1, Item 1) and tank discharge valve (V2) (Figure 1, Item 2) close.
5. Continue fueling operations if condition is fixed.

STEP

7. Open and close bottom loading valve (V1) (Figure 1, Item 1) and tank discharge valve (V2) (Figure 1, Item 2) using (V1/V2) control lever assembly (Figure 1, Item 3).
8. Activate the left emergency lever (Figure 3, Item 1) and verify that bottom loading valve (V1) (Figure 1, Item 1) and tank discharge valve (V2) (Figure 1, Item 2) close.
9. Open and close bottom loading valve (V1) (Figure 1, Item 1) and tank discharge valve (V2) (Figure 1, Item 2) using (V1/V2) control lever assembly (Figure 1, Item 3).

EMERGENCY LEVERS DO NOT CLOSE BOTTOM LOADING VALVE (V1) AND/OR TANK DISCHARGE VALVE (V2) - Continued

10. Activate the right emergency lever (Figure 3, Item 2) and verify that bottom loading valve (V1) (Figure 1, Item 1) and tank discharge valve (V2) (Figure 1, Item 2) close.

CONDITION/INDICATION

Is emergency lever difficult or impossible to move?

DECISION

YES - Proceed to Malfunction: Emergency lever faulty.
NO - Return MFS TRM to service.

MALFUNCTION

Emergency lever faulty

ACTION

1. Replace emergency lever (WP 0076).
2. Verify condition is fixed by completing the following steps:
   a. Open and close bottom loading valve (V1) (Figure 1, Item 1) and tank discharge valve (V2) (Figure 1, Item 2) using (V1/V2) control lever assembly (Figure 1, Item 3).
   b. Activate the left emergency lever (Figure 3, Item 1) and verify that bottom loading valve (V1) (Figure 1, Item 1) and tank discharge valve (V2) (Figure 1, Item 2) close.
   c. Open and close bottom loading valve (V1) (Figure 1, Item 1) and tank discharge valve (V2) (Figure 1, Item 2) using (V1/V2) control lever assembly (Figure 1, Item 3).
   d. Activate the right emergency lever (Figure 3, Item 2) and verify that bottom loading valve (V1) (Figure 1, Item 1) and tank discharge valve (V2) (Figure 1, Item 2) close.
3. Continue fueling operations if condition is fixed.

END OF WORK PACKAGE

MAINTAINER TROUBLESHOOTING
FUEL DISPENSING NOZZLE CAUSES STATIC SPARKS TROUBLESHOOTING PROCEDURE

INITIAL SETUP:

Tools and Special Tools
Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
Fire extinguisher (TM 10-4930-371-10)
Multimeter, digital (WP 0217, Table 1, Item 6)

Personnel Required
91J Quartermaster and Chemical Equipment Repairer

References
TM 10-4930-371-10

References (cont.)
WP 0125
WP 0126
WP 0143

Equipment Condition
MFS TRM grounded (TM 10-4930-371-10)
MFS TRM shut down (TM 10-4930-371-10)

Time to Complete
0.5 Hour(s)

GENERAL

This work package contains Maintainer troubleshooting procedures for MFS TRM. Use this work package to help isolate and correct system problems. Ensure all operator PMCS and troubleshooting procedures have been performed.

TROUBLESHOOTING PROCEDURE

FUEL DISPENSING NOZZLE CAUSES STATIC SPARKS

WARNING

- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the Modular Fuel System Tank Rack Module (MFS TRM) prior to the transfer of fuel.
- Failure to comply could result in injury or death to personnel.

STEP

1. Visually inspect static reel ground strap (Figure 1, Item 2) for damage.

FUEL DISPENSING NOZZLE CAUSES STATIC SPARKS - Continued

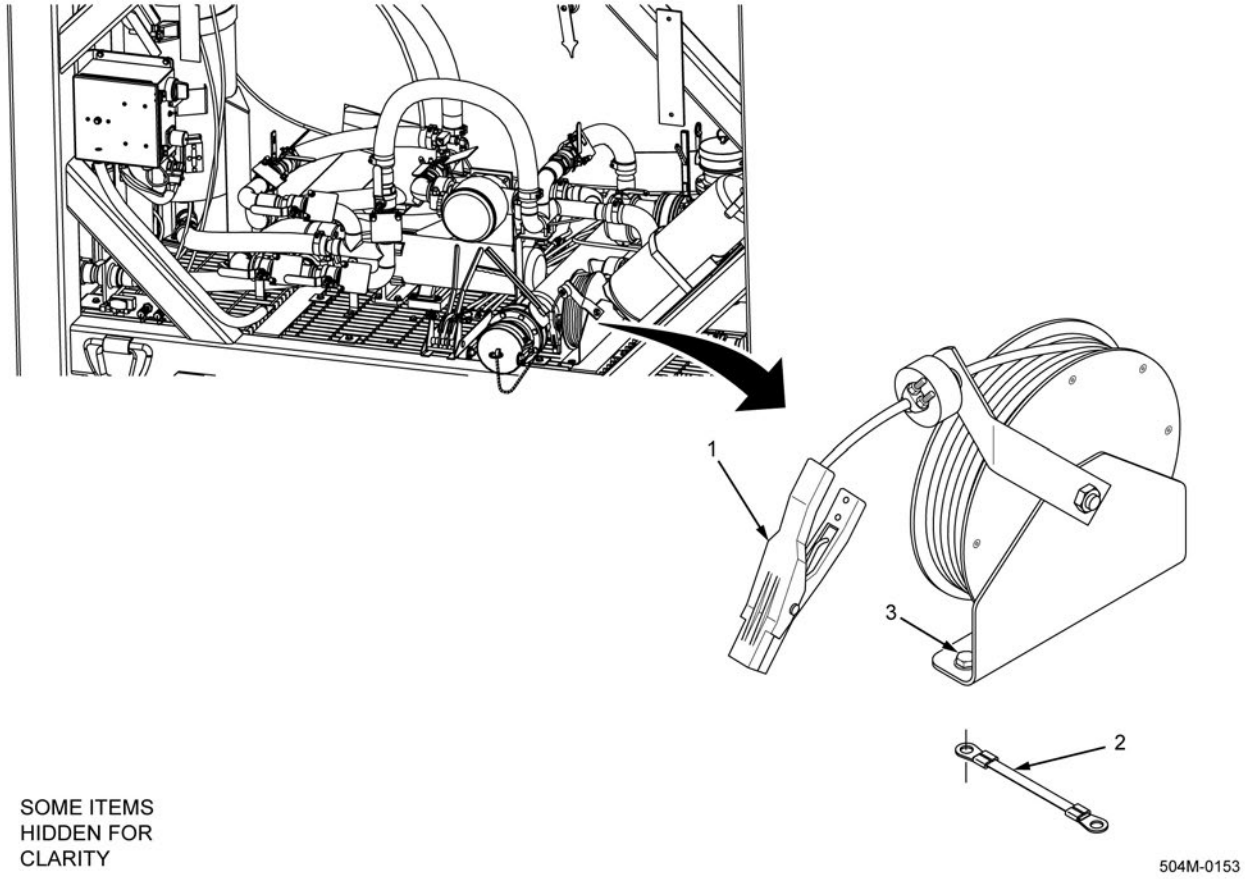


Figure 1. Static Reel.

FUEL DISPENSING NOZZLE CAUSES STATIC SPARKS - Continued

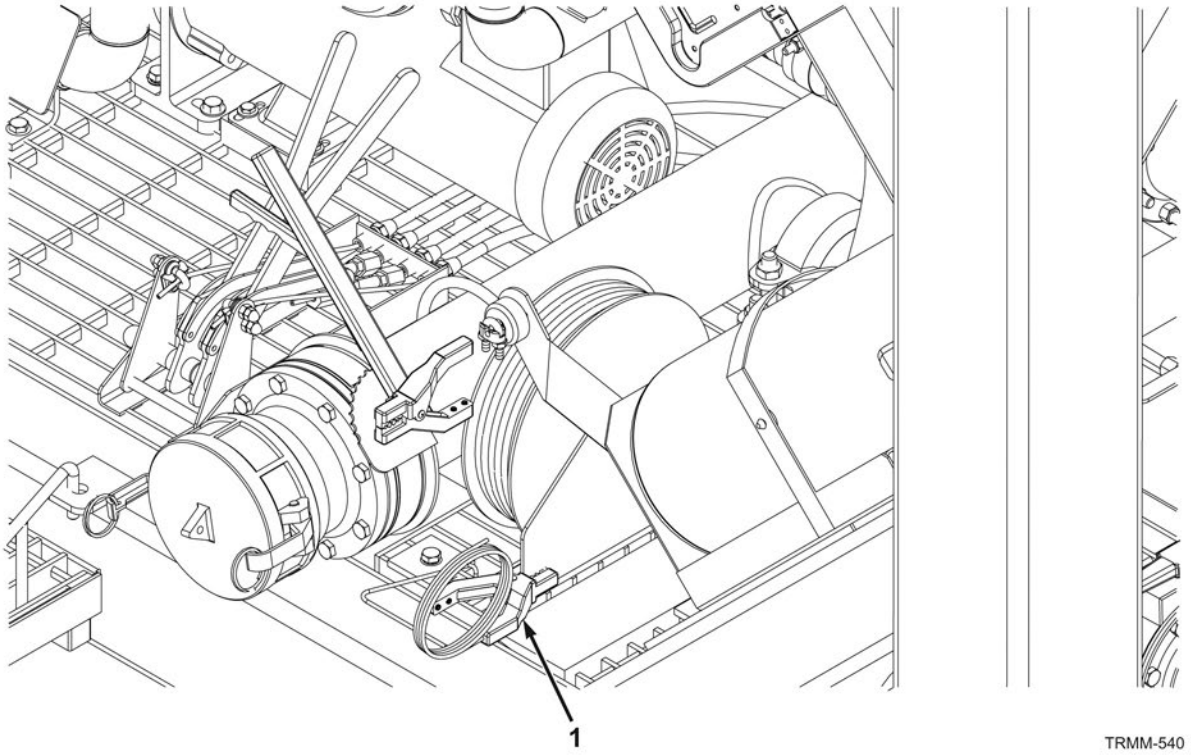


Figure 2. TRM With ADR Bonding Clamp.

CONDITION/INDICATION

Is the ground strap damaged?

DECISION

YES - Proceed to Malfunction: Ground strap faulty.
NO - Proceed to Step 2.

MALFUNCTION

Ground strap faulty

ACTION

1. Check static reel ground strap (Figure 1, Item 2) for loose connection or other signs of visible damage that could impair proper grounding. Tighten attaching hardware or replace ground strap as required (WP 0126).
2. Continue fueling operations if condition is fixed.

STEP

2. Measure resistance between cable clip (Figure 1, Item 1) and static reel bolt (Figure 1, Item 3).

CONDITION/INDICATION

Is resistance greater than 10 ohms?

FUEL DISPENSING NOZZLE CAUSES STATIC SPARKS - Continued

DECISION

YES - Proceed to Malfunction: Static reel faulty.
NO - Proceed to Malfunction: Fuel dispensing nozzle faulty. For TRM with ADR, proceed to Step 3.

MALFUNCTION

Static reel faulty

ACTION

1. Replace static reel (WP 0143).
2. Verify condition is fixed by repeating Step 2.
3. Continue fueling operations if condition is fixed.

MALFUNCTION

Fuel dispensing nozzle faulty

ACTION

1. Repair fuel dispensing nozzle (WP 0125).
2. Continue fueling operations if condition is fixed.

STEP

3. Measure resistance between bonding clamp (Figure 2, Item 1) and static reel bolt (Figure 1, Item 3).

CONDITION/INDICATION

Is resistance greater than 10 ohms?

DECISION

YES - Proceed to Malfunction: Bonding clamp faulty.
NO - Proceed to Malfunction: Fuel dispensing nozzle faulty.

MALFUNCTION

Bonding clamp faulty

ACTION

1. Replace bonding clamp (WP 0143).
2. Verify condition is fixed by repeating Step 3.
3. Continue fueling operations if condition is fixed.

FUEL DISPENSING NOZZLE CAUSES STATIC SPARKS - Continued

MALFUNCTION

Fuel dispensing nozzle faulty

ACTION

1. Repair fuel dispensing nozzle (WP 0125).
2. Continue fueling operations if condition is fixed.

END OF WORK PACKAGE

CHAPTER 3

MAINTAINER MAINTENANCE INSTRUCTIONS

MAINTAINER MAINTENANCE
SERVICE UPON RECEIPT

INITIAL SETUP:

Tools and Special Tools
Tool kit, general mechanic's (WP 0217, Table 1, Item 13)

Personnel Required
91J Quartermaster and Chemical Equipment Repairer

References
DA PAM 750-8

References (cont.)
DD Form 361, Transportation Discrepancy Report
DTR 4500.9-R, Part II
TM 10-4930-371-10

SERVICE UPON RECEIPT OF MATERIAL

GENERAL

This work package contains the procedures for unpacking and general checking of Modular Fuel System Tank Rack Module (MFS TRM).

1. Inspect the equipment for damage incurred during shipment. If the equipment has been damaged, report the damage on DD Form 361, Transportation Discrepancy Report.
2. Check equipment against the packing slip to ensure that the shipment is complete. Report all discrepancies IAW applicable service instructions in DA PAM 750-8.

INSPECTION

Inspect the equipment for damage incurred during shipment. If the equipment has been damaged, report the damage on DD Form 361, Transportation Discrepancy Report. Check the equipment against the packing slip to see if the shipment is complete. Report all discrepancies IAW DTR 4500.9-R, Part II. Check to see whether the equipment has been modified.

UNPACKING

Remove any protective covers or shipping materials from the MFS TRM and dispose of IAW local policy.

CHECK EQUIPMENT

Inspect equipment per Table 1. Inspect the equipment for damage incurred during shipment. If the equipment has been damaged, report the damage on DD Form 361, Transportation Discrepancy Report. Check the equipment against the packing slip to see if the shipment is complete. Report all discrepancies IAW DTR 4500.9-R, Part II. Check to see whether the equipment has been modified.

CHECK EQUIPMENT - Continued

Table 1. Special Service Instructions.

Component	Acceptable	Repairable	Non-Repairable
MFS TRM	Free from major damage.	Any damage that does not affect the serviceability of the MFS TRM.	Major damage that affects the serviceability of the MFS TRM.
Couplings	Minor rust or corrosion that would not impair serviceability of the couplings.	Minor rust or corrosion that can be removed without affecting the serviceability of the couplings.	Rust, damage, or corrosion that affects serviceability of the couplings.
Valve Assemblies	Minor rust or corrosion that would not impair serviceability or the valve assemblies.	Minor rust or corrosion that can be removed without affecting the serviceability of the valve assemblies.	Rust, damage, or corrosion that affects serviceability of the valve assemblies.
Nozzles	Free from major damage.	Minor rust or corrosion that can be removed without affecting the serviceability of the nozzles.	Rust, damage, or corrosion that affects serviceability of the nozzles.
Hoses	Free of rips and tears.	Not applicable.	Major rips or tears.

INSTALLATION INSTRUCTIONS

Set up the MFS TRM IAW Operator TM 10-4930-371-10. The MFS TRM can be set up for operation with no special tools or test equipment.

PRELIMINARY SERVICE

Refer to the Before PMCS procedures in Operator TM 10-4930-371-10 before starting procedures.

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) INTRODUCTION

GENERAL

1. Systematic, periodic Preventive Maintenance Checks and Services (PMCS) are essential to ensure that the MFS TRM is ready for operation at all times. The purpose of a preventive maintenance program is to discover and correct defects and deficiencies before they can cause serious damage or complete failure of the equipment. Any effective preventive maintenance program must begin with the indoctrination of Operators to notify Maintainer of all unusual conditions noted during daily checks or actual operation. All defects and deficiencies discovered during maintenance inspections must be recorded, together with corrective action taken, on DA Form 5988-E or DA Form 2404, Equipment Inspection and Maintenance Worksheet. Pay attention to WARNING and CAUTION statements. A WARNING means someone could be injured or killed. A CAUTION means equipment could get damaged.
2. Ensure all Operator PMCS procedures have been performed (TM 10-4930-371-10).
3. A schedule for Maintainer inspection and service should be established immediately after initial operation of the MFS TRM. When operating under unusual conditions, such as a very dusty or sandy environment, it may be necessary to reduce the interval to monthly or even less if conditions are extreme.
4. If you find something wrong when performing PMCS, fix it, if you can, using troubleshooting procedures and/ or maintenance procedures.
5. The right-hand column of the PMCS table lists conditions that make the equipment not fully mission capable.
6. Use DA Form 5988-E or DA Form 2404 to report items that have not been fixed. For further information on how to use these forms, see DA PAM 750-8.
7. Perform Annual PMCS once each year.

LEAKAGE DEFINITIONS

WARNING

Goggles and gloves must be worn when working around fuel. Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.

CAUTION

Any leaks must be corrected before operating the MFS TRM. Failure to comply may cause damage to equipment.

1. If there is any leak, shut down operation immediately, and repair the fault.

LEAKAGE DEFINITIONS - Continued

2. It is important to understand how fluid leakage affects the status of the MFS TRM. Following are definitions of the leakage classes the Maintainers need to become familiar with in order to determine the condition of the leak. When in doubt, always consult your supervisor.
3. Leakage Classifications for PMCS:
   a. CLASS I - Seepage of fluid (as indicated by wetness or discoloration) but not great enough to form drops.
   b. CLASS II - Leakage of fluid great enough to form drops but not enough to cause drops to drip from item being inspected.
   c. CLASS III - Leakage of fluid great enough to form drops that fall from the item being inspected.

INSPECTION

Look for signs of a problem or trouble. You can feel, smell, hear, or see many problems. Be alert when using the equipment.

Inspect to ensure items are in good condition. Ensure that they are properly lubricated, correctly assembled, stowed, secured, and are not excessively worn, leaking, or corroded. Correct any problems found. The following are common items to check throughout the equipment:

Bolts, clamps, nuts, and screws

Tighten loose connectors and look for chipped paint, bare metal, rust, or corrosion around bolts, screw heads, and nuts.

Welds

Many items on the equipment are welded. To check for defective welds, look for chipped paint, rust, corrosion, or gaps.

Electrical wires, connectors, and harnesses

Tighten loose connectors. Look for cracked or broken insulation, bare wires, and broken connectors. If any of these conditions exist, repair as required.

Hoses and fluid lines

Look for wear, damage, and leaks. Ensure that clamps and fittings are tight. A wet spot indicates leakage. A stain near a fitting or connector can also indicate leakage. If a leak is discovered, repair immediately.

LUBRICATION SERVICE INTERVALS - NORMAL CONDITIONS

For safer, more trouble-free operations, ensure that your equipment is serviced as scheduled.

LUBRICATION SERVICE INTERVALS - UNUSUAL CONDITIONS

Your equipment will require extra service and care when you operate under unusual conditions. High or low temperatures and/or long periods of hard use or continued use in sand, water, mud, or snow will break down the lubricant.

CLEANING AND LUBRICATION

WARNING

Solvent cleaning compound MIL-PRF-680 Type III is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Keep away from open flames and other sources of ignition. Failure to comply may cause injury to personnel.

WARNING

Grease contains ingredients that can cause mild skin contact hazard. Treat random or occasional skin contact with mild soap and water. Gloves and eye protection is required with heavy, constant exposure. Do not ingest. Immediately clean up any spilled compound. Comply with local procedures and environmental regulations when disposing of grease or cleanup materials. Failure to comply may result in injury to personnel and/or damage to the environment.

The following cleaning and lubrication procedures can aid in preventing equipment problems:

CAUTION

Follow all cleaning and lubrication instructions carefully. Failure to comply could result in damage to equipment.

1. Thoroughly wash all equipment exposed to salt and spray with clean, fresh water.
2. Use solvent cleaning compound, MIL-PRF-680 or equivalent, to clean parts that will be lubricated. Do not use fluid or semi-fluid lubricant on coated surfaces. Wipe surface dry before lubricating.
3. Clean grease fittings before lubrication.
4. Lubricate all equipment before equipment storage.
5. Always use the PMCS lubrication instructions as a guide.
6. Lubricate more during constant use and less during inactive periods.
7. Use the correct grade of lubricant for seasonal temperature expected.
8. Never use the wrong type or grade of lubricant.

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) INCLUDING LUBRICATION INSTRUCTIONS

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposable nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)
- Grease gun (WP 0217, Table 1, Item 5)
- Mulitimeter, digital (WP 0217, Table 1, Item 6)
- Oiler, hand (WP 0217, Table 1, Item 7)
- Wrench, socket impact, 1/2" drive, 6 pt, deep, 15/16" (WP 0217, Table 1, Item 20)
- Wrench, torque, click, ratcheting, 1/2 inch drive, 250 lb-ft (WP 0217, Table 1, Item 22)

Materials/Parts
- Absorbent material (WP 0216, Table 1, Item 1)
- Cloth, cleaning (WP 0216, Table 1, Item 4)
- Grease, automotive and artillery (WP 0216, Table 1, Item 7)
- Oil, lubricating, general purpose (WP 0216, Table 1, Item 9)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer (2)

References
- WP 0126
- WP 0143
- WP 0144.4

Equipment Condition
- MFS TRM loaded on PLS trailer (TM 10-4930-371-10)
- MFS TRM grounded (TM 10-4930-371-10)
- MFS TRM handrails and handhold raised (TM 10-4930-371-10)
- MFS TRM ladder platform emplaced (TM 10-4930-371-10)
- MFS TRM ladder emplaced (TM 10-4930-371-10)

Time to Complete
- 3.0 Hour(s)

Table 1. Preventive Maintenance Checks and Services

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
1	Annual	Control lever assembly and control cables	**WARNING** Grease contains ingredients that can cause mild skin contact hazard. Treat random or occasional skin contact with mild soap and water. Gloves and eye protection is required with heavy, constant exposure. Do not ingest. Immediately clean up any spilled compound. Comply with local procedures and environmental regulations when disposing of grease or cleanup materials. Failure to comply may result in injury to personnel and/or damage to the environment. Lubricate control cables and lever assembly IAW Figure 1 of this WP. 1. For lever assembly, apply two full pumps of GAA with grease gun to each of two grease fittings. 2. For cable lubrication points, apply four full pumps of GAA grease with gun to each of six fittings.	Grease fittings are damaged or missing.
2	Annual	Control cable tubing	Inspect control cable tubing IAW Figure 1 of this WP. Inspect control cable tubing for damage.	There is damage that restricts control cable operation.
3	Annual	Pump assembly	Lubricate pump assembly IAW Figure 2 of this WP. Apply two full pumps of GAA grease with grease gun to each of two grease fittings on pump assembly.	Pump assembly grease fittings are damaged or missing.
4	Annual	Tank gauge	Lubricate tank gauge IAW Figure 3 of this WP. Apply two full pumps of GAA grease with grease gun to tank gauge grease fittings.	Tank gauge grease fitting is damaged or missing.

Table 1. Preventive Maintenance Checks and Services - Continued

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
5	Annual	BII/COEI and hose cabinet hinges and latches	Lubricate hinges and latches IAW Figure 4 of this WP. 1. Open BII/COEI cabinet and apply a light coating of general purpose lubricating oil to hinge. 2. On BII/COEI cabinet, apply a light coating of general purpose lubricating oil to two latches. 3. On hose tube cabinet, apply a light coating of general purpose lubricating oil to two hinges. 4. On hose tube cabinet, apply light coating of general purpose lubricating oil to two latches.	
6	Annual	Handrail assembly and handholds	Lubricate handrail assembly and handholds IAW Figure 5 of this WP. 1. Apply a light coating of general purpose lubricating oil to pivot point of handholds. 2. Apply a light coating of general purpose lubricating oil to four points of handrail assembly.	
7	Annual	Spillbox lid and manhole cover	Lubricate spillbox lid and manhole cover IAW Figure 6 of this WP. 1. Open spillbox lid. 2. Apply a light coating of general purpose lubricating oil to spillbox lid hinge, pivot points of manhole cover, and latch assembly. 3. Inspect fire screen. 4. Close spillbox lid.	If fire screen is missing or damaged, replace IAW (WP 0144.4).

Table 1. Preventive Maintenance Checks and Services - Continued

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
8	Annual	Component ground straps	Check the continuity of ground cables from pump assembly to frame IAW Figure 7 of this WP. 1. Measure resistance by touching black probe of multimeter to a metal part of the MFS TRM frame, and red probe of multimeter to the following components: **NOTE** Resistance measurements must be made on bare metal surfaces. a. Filter/separator assembly (Figure 7, Item 1) b. Pump assembly (Figure 7, Item 4) c. Clip on end of static reel (Figure 7, Item 2) d. Port E coupling (Figure 7, Item 3), touch red probe to silver portion (Figure 7, Item 5) of port face as shown. e. Port D coupling (Figure 7, Item 6), touch red probe to silver portion (Figure 7, Item 5) of port face as shown. f. For TRM with ADR, touch red probe to top bolt of grounding strap (Figure 8, Item 1). 2. If resistance is greater than 10 ohms, check component ground strap and hardware for tightness and serviceability. If ground strap is damaged, replace ground strap IAW (WP 0126).	No continuity between pump assembly and frame.

Table 1. Preventive Maintenance Checks and Services - Continued

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
9	Annual	Static reel and bonding clamp	Measure the resistance of static reel (Figure 9, Item 1). Touch the positive (red) probe to teeth on clamp (Figure 9, Item 3) and the negative (black) probe to the MFS TRM frame. 1. For TRM with ADR, check bonding clamp resistance. Touch the positive (red) probe to teeth on bonding clamp (Figure 9, Item 2) and the negative (black) probe to the MFS TRM frame. 2. If resistance is greater than 10 ohms, replace the static reel IAW (WP 0143).	Resistance is greater than 10 ohms.
10	Annual	Tank frame weldment	Inspect all welded points on MFS TRM.	Broken, cracked, or damaged welds
11	Annual	Tank frame mounting bolts	Inspect mounting bolts that secure tank to frame IAW Figure 10 of this WP. 1. Check bolts (Figure 10, Item 1), flat washers (Figure 10, Items 5 and 6), lockwashers (Figure 10, Item 4), and nuts (Figure 10, Items 2 and 3) for tightness. 2. Remove second nut (Figure 10, Item 2), torque first nut to 60 ft-lbs. While holding first nut (Figure 10, Item 3), reinstall second nut (Figure 10, Item 2) and torque second nut to 200 ft-lbs.	Damaged or missing hardware.

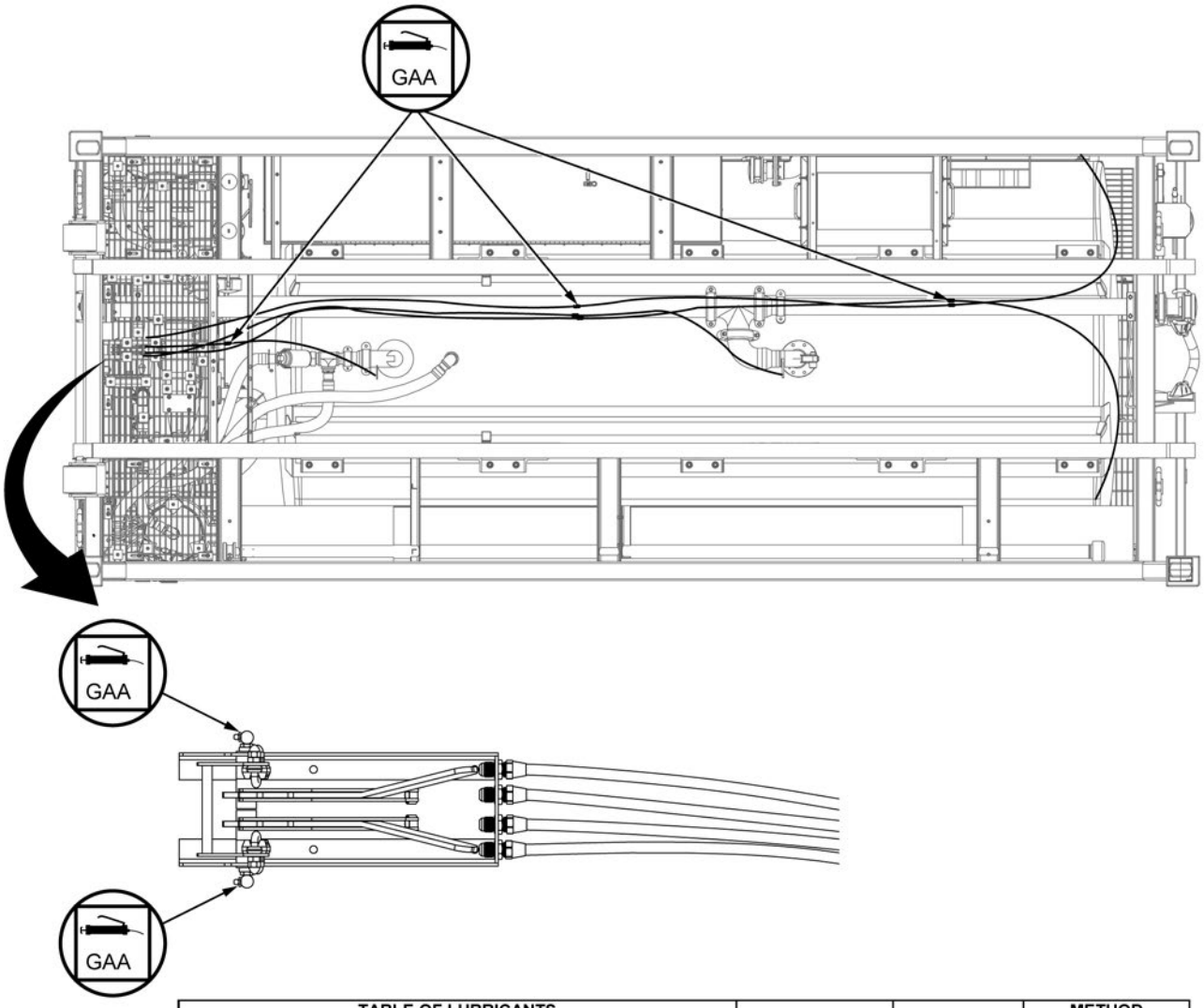


TABLE OF LUBRICANTS			SYMBOLS	FREQUENCY	METHOD OF APPLICATION
IDENTIFICATION CODE	SPECIFICATION	TYPE OF LUBRICANT		ANNUAL	GREASE GUN
GAA	MIL-PRF-10924-D	GREASE, AUTOMOTIVE AND ARTILLERY	GAA		

Figure 1. Control Cables Assembly Lubrication Chart.

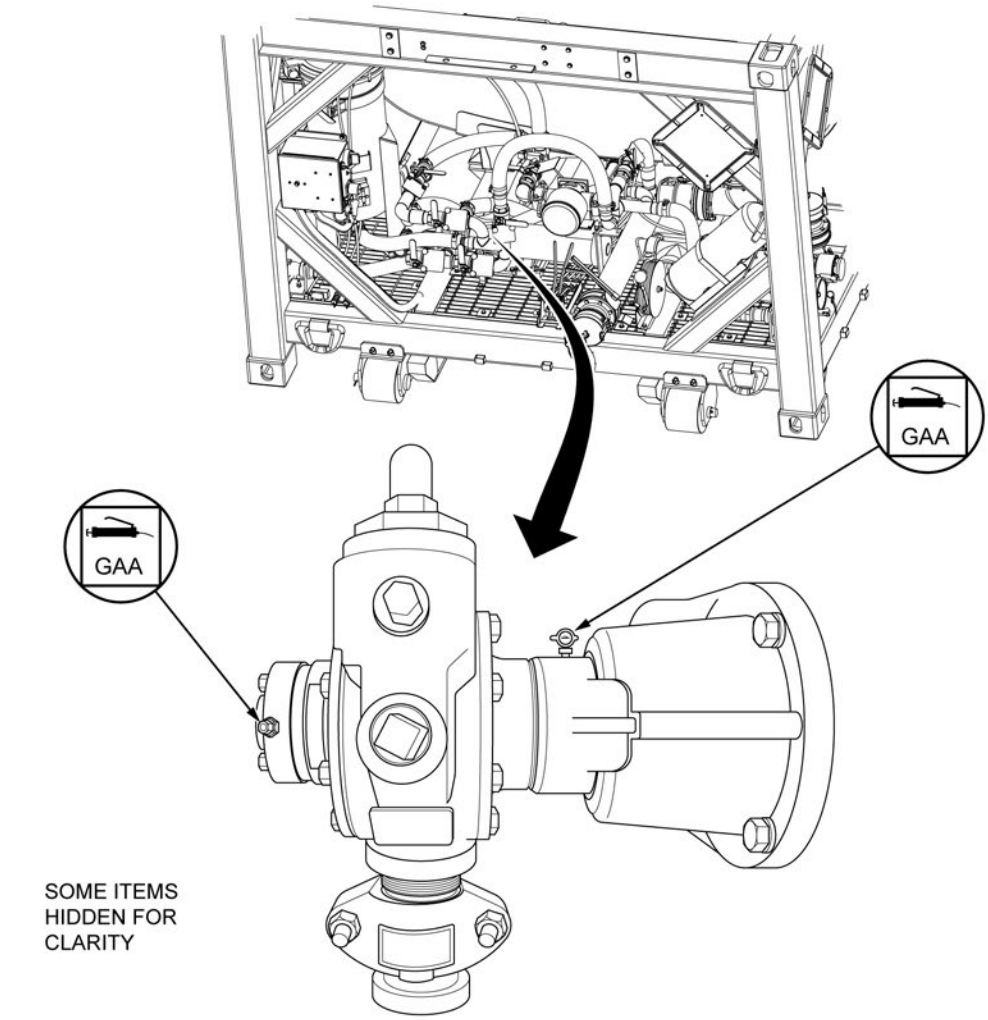


TABLE OF LUBRICANTS			SYMBOLS	FREQUENCY	METHOD OF APPLICATION
IDENTIFICATION CODE	SPECIFICATION	TYPE OF LUBRICANT		ANNUAL	GREASE GUN
GAA	MIL-PRF-10924-D	GREASE, GENERAL AUTOMOTIVE AND ARTILLERY	GAA		

TRMM-0289

Figure 2. Pump Assembly Lubrication Locations.

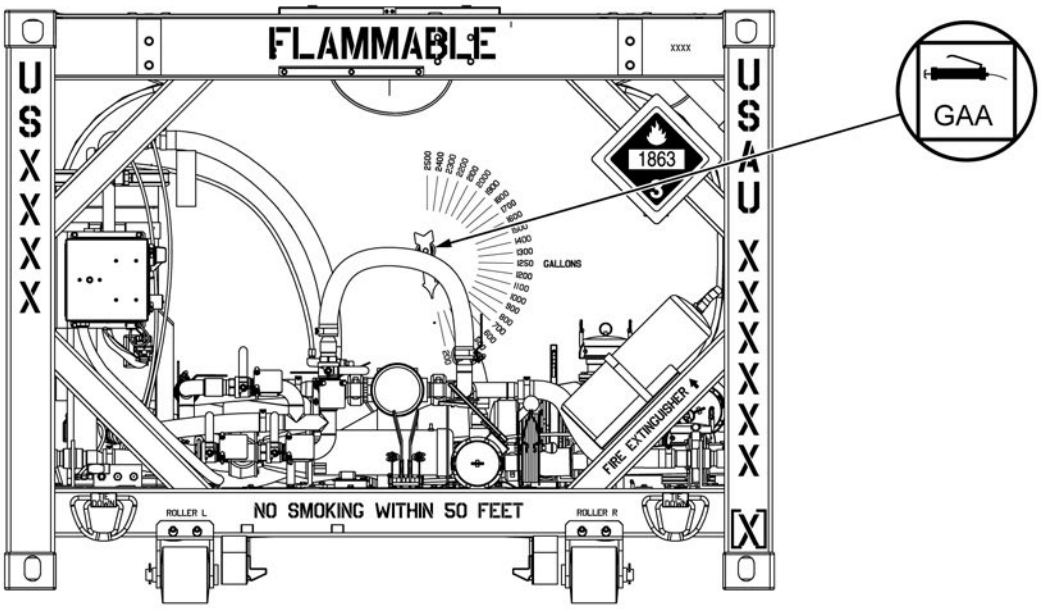


TABLE OF LUBRICANTS			SYMBOLS	FREQUENCY	METHOD OF APPLICATION
IDENTIFICATION CODE	SPECIFICATION	TYPE OF LUBRICANT		ANNUAL	GREASE GUN
GAA	MIL-PRF-10924-D	GREASE, GENERAL AUTOMOTIVE AND ARTILLERY	GAA		

TRMM-0003

Figure 3. Tank Gauge Lubrication Chart.

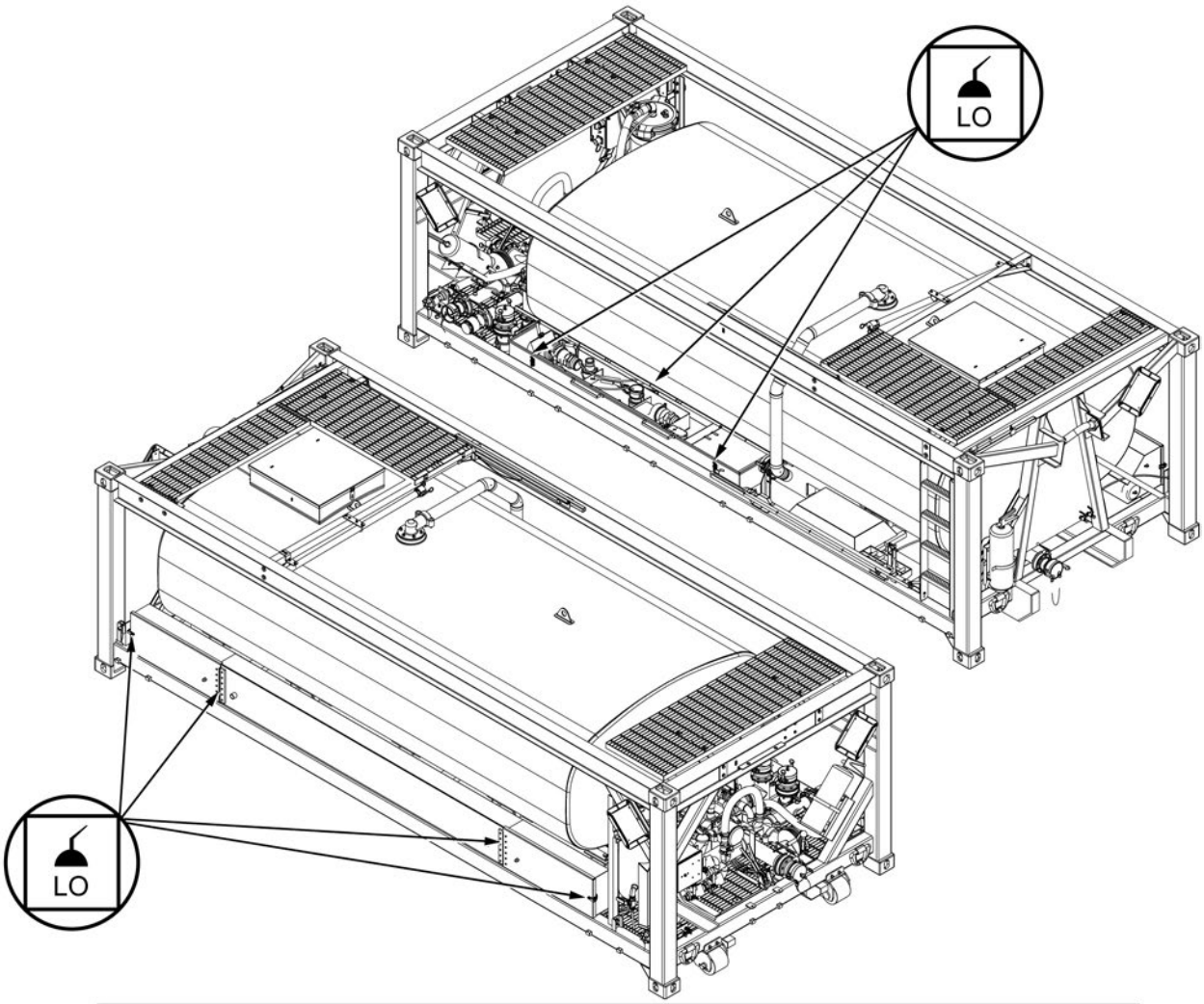


TABLE OF LUBRICANTS			SYMBOLS	FREQUENCY	METHOD OF APPLICATION
IDENTIFICATION CODE	SPECIFICATION	TYPE OF LUBRICANT		ANNUAL	OIL CAN
LO	MIL-PRF-7870	LUBRICATING OIL, GENERAL PURPOSE	LO		

TRMM-0004

Figure 4. BII/COEI Cabinet and Hose Cabinet Hinges and Latches Lubrication Chart.

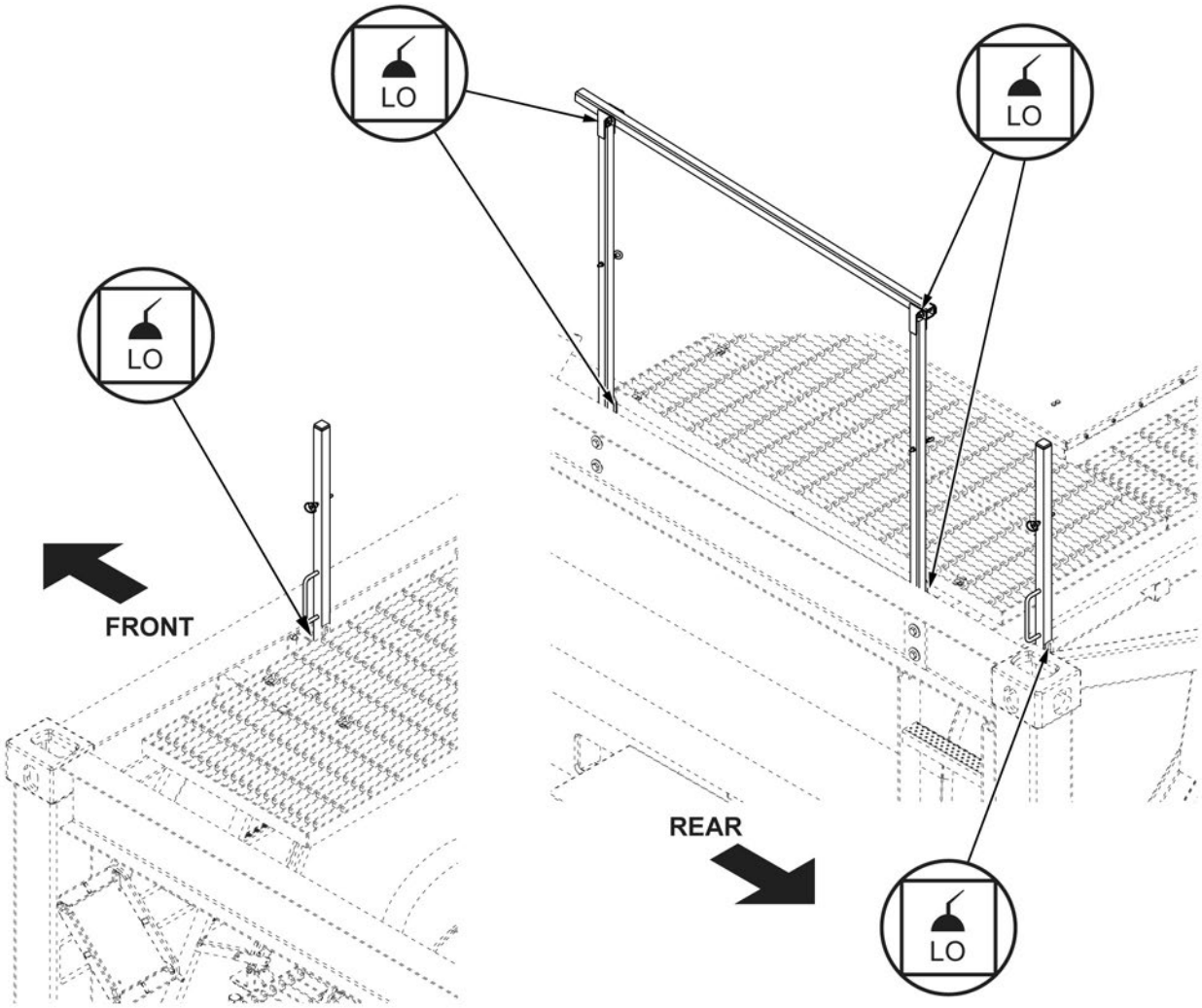


TABLE OF LUBRICANTS			SYMBOLS	FREQUENCY	METHOD OF APPLICATION
IDENTIFICATION CODE	SPECIFICATION	TYPE OF LUBRICANT		ANNUAL	OIL CAN
LO	MIL-PRF-7870	LUBRICATING OIL, GENERAL PURPOSE	LO		

TRMM-0243

Figure 5. Handrail Assembly and Handholds Lubrication Chart.

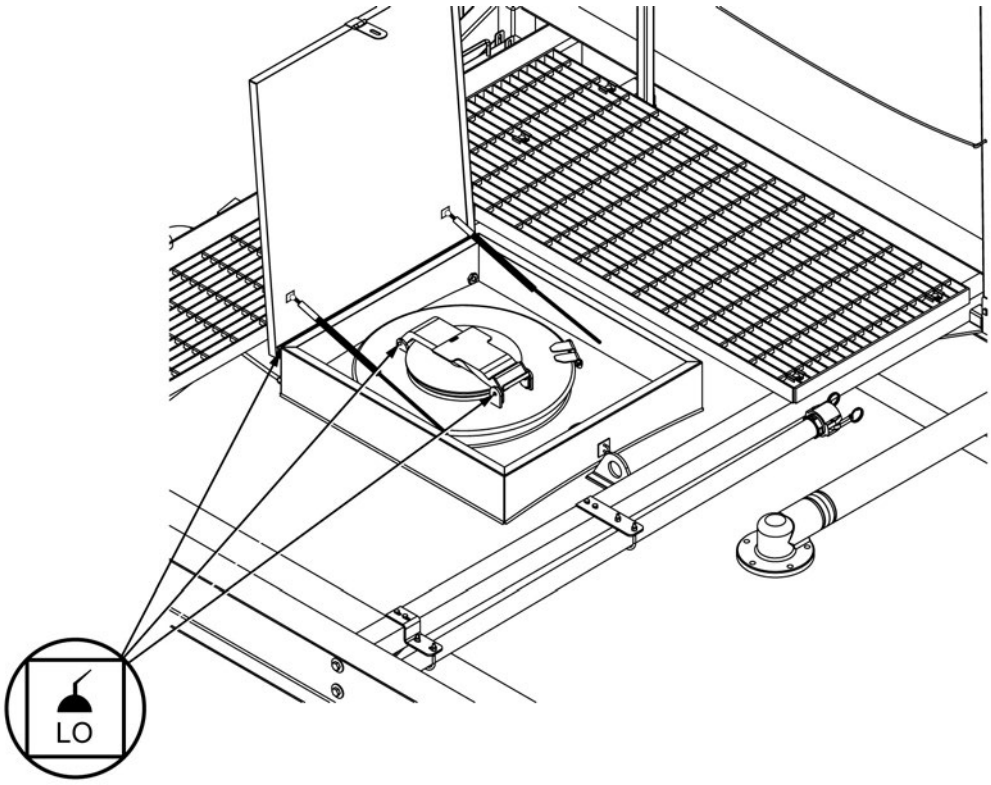


TABLE OF LUBRICANTS			SYMBOLS	FREQUENCY	METHOD OF APPLICATION
IDENTIFICATION CODE	SPECIFICATION	TYPE OF LUBRICANT		ANNUAL	OIL CAN
LO	MIL-PRF-7870	LUBRICATING OIL, GENERAL PURPOSE	LO		

TRMM-0245

Figure 6. Spillbox Lid and Manhole Cover Lubrication Chart.

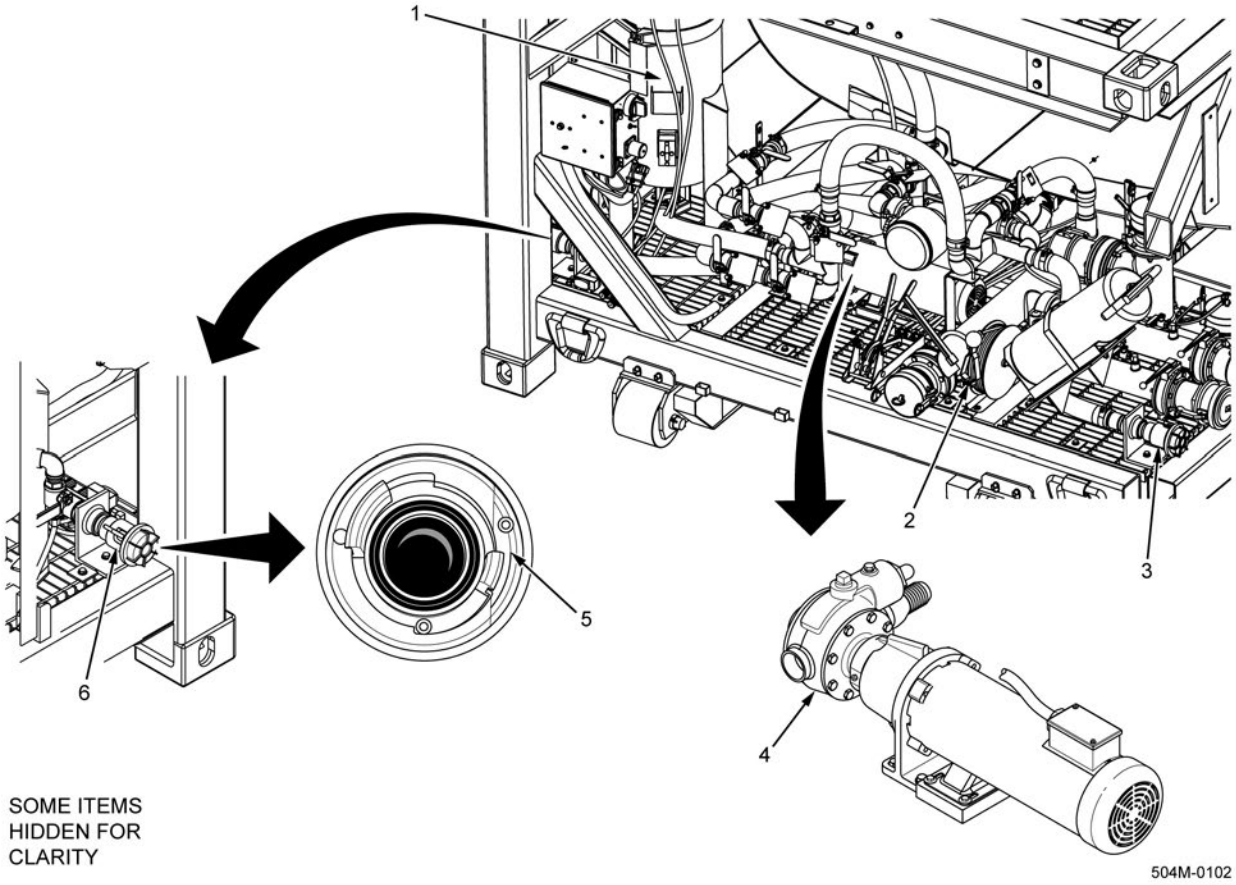


Figure 7. Component Ground Strap Resistance Check.

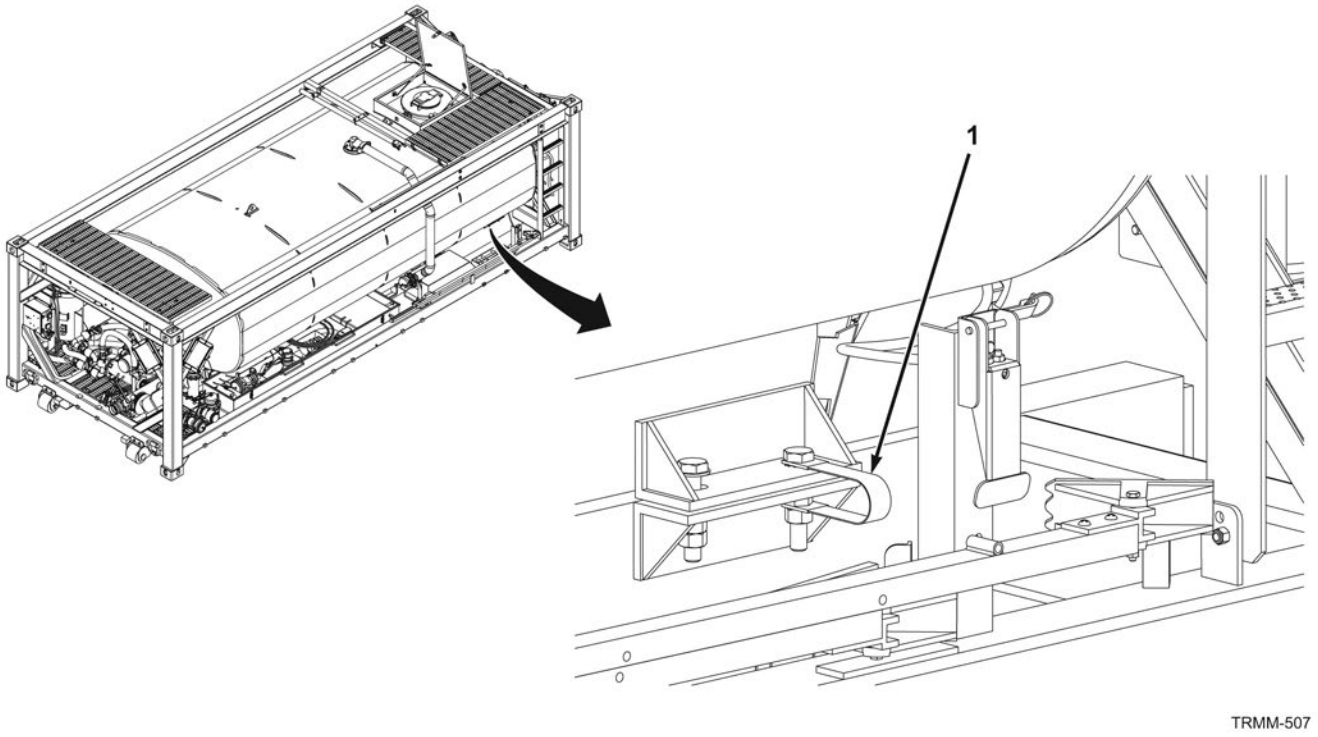


Figure 8. TRM With ADR Tank to Frame Grounding Strap.

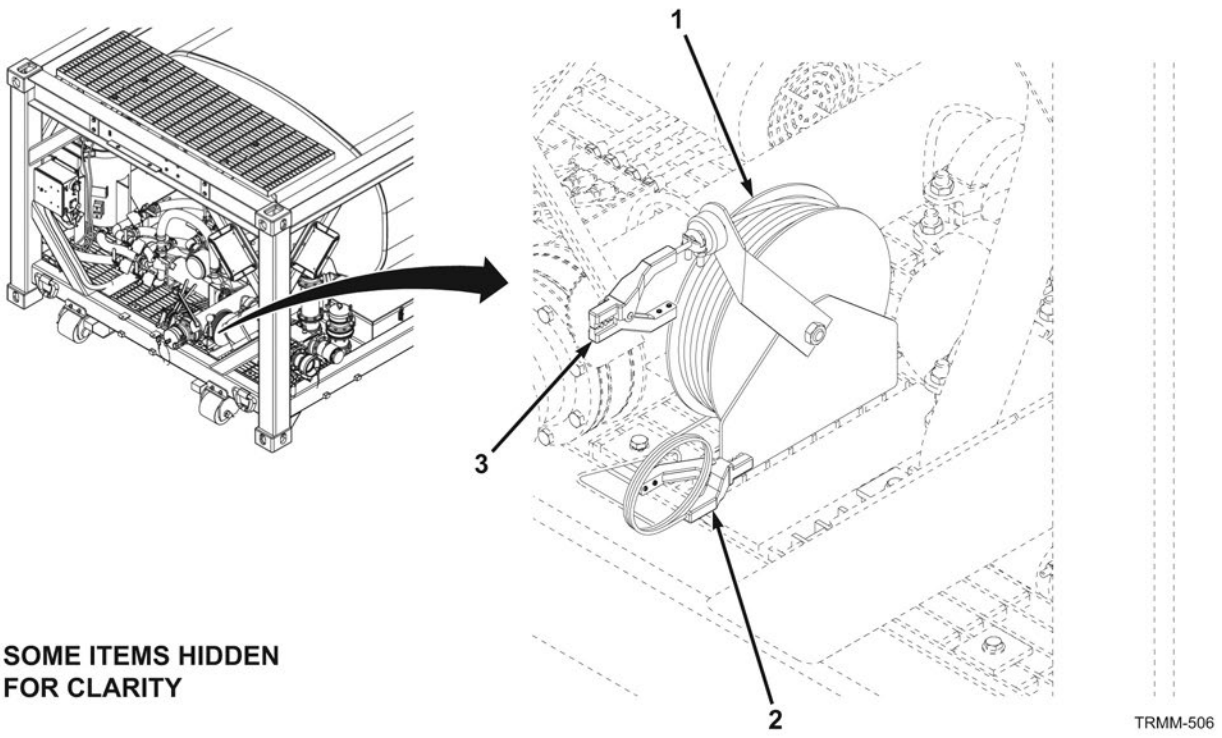


Figure 9. Static Reel Continuity Check.

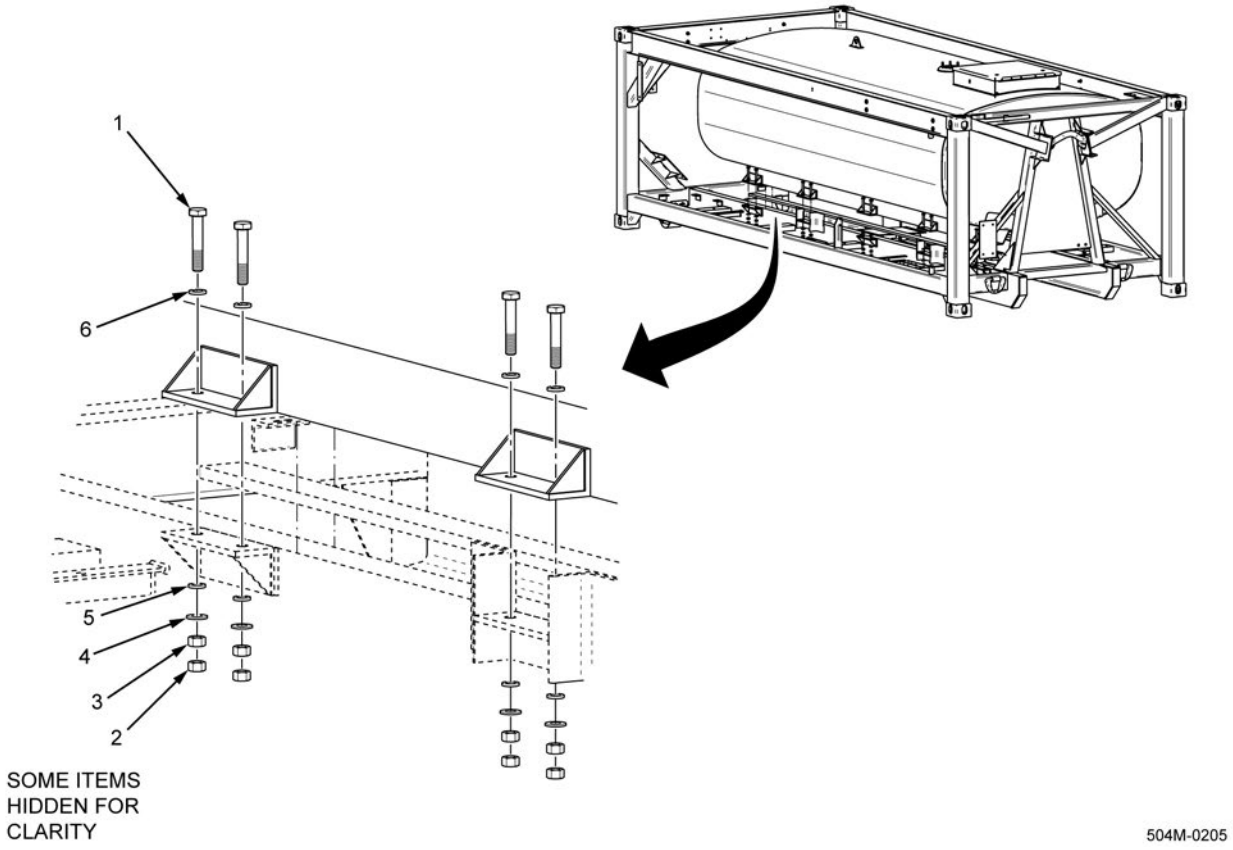


Figure 10. Tank Frame Mounting Bolts.

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
BOTTOM LOADING VALVE (V1) REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Crow's foot attachment, 3/4" (WP 0217, Table 1, Item 2)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposable nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)
- Pan, drip (WP 0217, Table 1, Item 8)
- Wrench, torque, click, ratcheting, 3/8 inch drive, 20 to 100 lb-ft. (WP 0217, Table 1, Item 23)

Materials/Parts
- Absorbent material (WP 0216, Table 1, Item 1)
- Cleaning compound, solvent (WP 0216, Table 1, Item 3)
- Cloth, cleaning (WP 0216, Table 1, Item 4)
- Sealing compound (WP 0216, Table 1, Item 13)
- Cotter Pin (WP 0149, Figure 3, Item 3)
- Cotter Pin (WP 0149, Figure 3, Item 6)
- Gasket (WP 0149, Figure 3, Item 2)
- Gasket (WP 0185, Figure 39, Item 3)
- Gasket (WP 0185, Figure 39, Item 7)
- Bottom Loading Valve (V1) (WP 0149, Figure 3, Item 8)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer (2)

References
- ATP 4-43
- TM 10-4930-371-10
- WP 0058
- WP 0073

Equipment Condition
- MFS TRM grounded (TM 10-4930-371-10)
- MFS TRM loaded on PLS trailer (TM 10-4930-371-10)
- MFS TRM ladder platform emplaced (TM 10-4930-371-10)
- MFS TRM ladder emplaced (TM 10-4930-371-10)
- MFS TRM drained (TM 10-4930-371-10)
- Handrail and handhold raised (TM 10-4930-371-10)
- Vent valve removed (WP 0058)

Time to Complete
- 3 Hour(s)

REMOVAL

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Failure to comply could result in injury or death to personnel.

1. Place drip pan under bottom loading valve (V1) to catch residual fuel.
2. Remove two nuts (Figure 1, Item 4) and two bolts (Figure 1, Item 2) at coupling between elbow (Figure 1, Item 3) and tee (Figure 1, Item 6), and remove coupling halves (Figure 1, Item 1).
3. Gradually slide coupling gasket (Figure 1, Item 5) to control fuel drainage from coupling and to prevent fuel from splashing on fork lift plate. Gradually open bottom loading valve (V1) to assist in draining.

REMOVAL - Continued

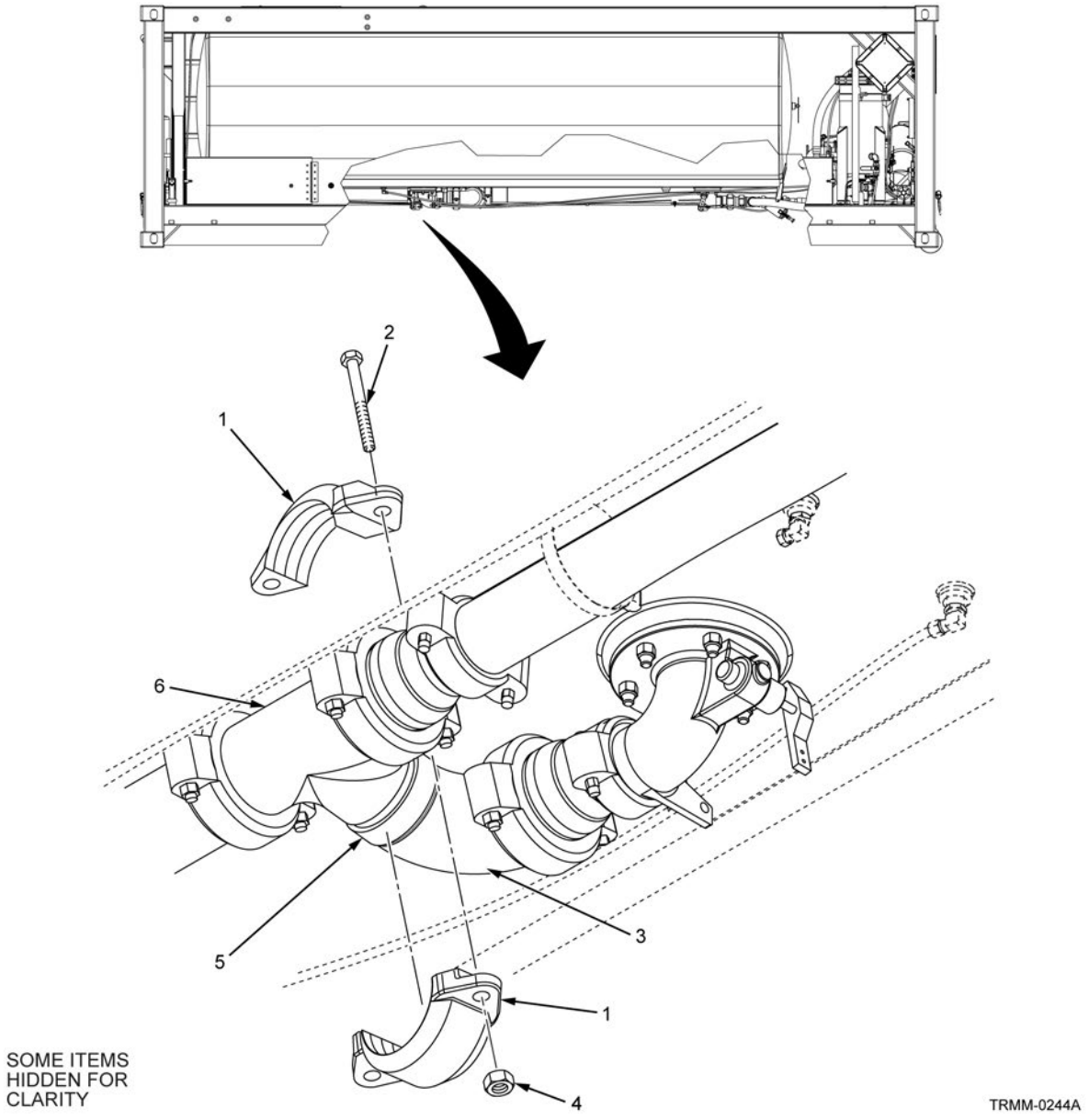


Figure 1. Draining Residual Fuel.

4. Close bottom loading valve (V1) and slide coupling gasket (Figure 1, Item 5) onto tee (Figure 1, Item 6).

REMOVAL - Continued

5. Remove fusible link as follows:
   a. Loosen locking nut (Figure 2, Item 7) and detach cable (Figure 2, Item 6) from fusible link (Figure 2, Item 8).
   b. Remove cotter pin (Figure 2, Item 1) and fusible link (Figure 2, Item 8) from pin (Figure 2, Item 9). Discard cotter pin.
6. While holding brass fitting (Figure 2, Item 5) disconnect tube nut (Figure 2, Item 4) from brass fitting (Figure 2, Item 5) using care not to damage tubing (Figure 2, Item 3).
7. Pull control cable (Figure 2, Item 6) through brass fitting (Figure 2, Item 5) and clear of bottom loading valve (V1) assembly (Figure 2, Item 2).

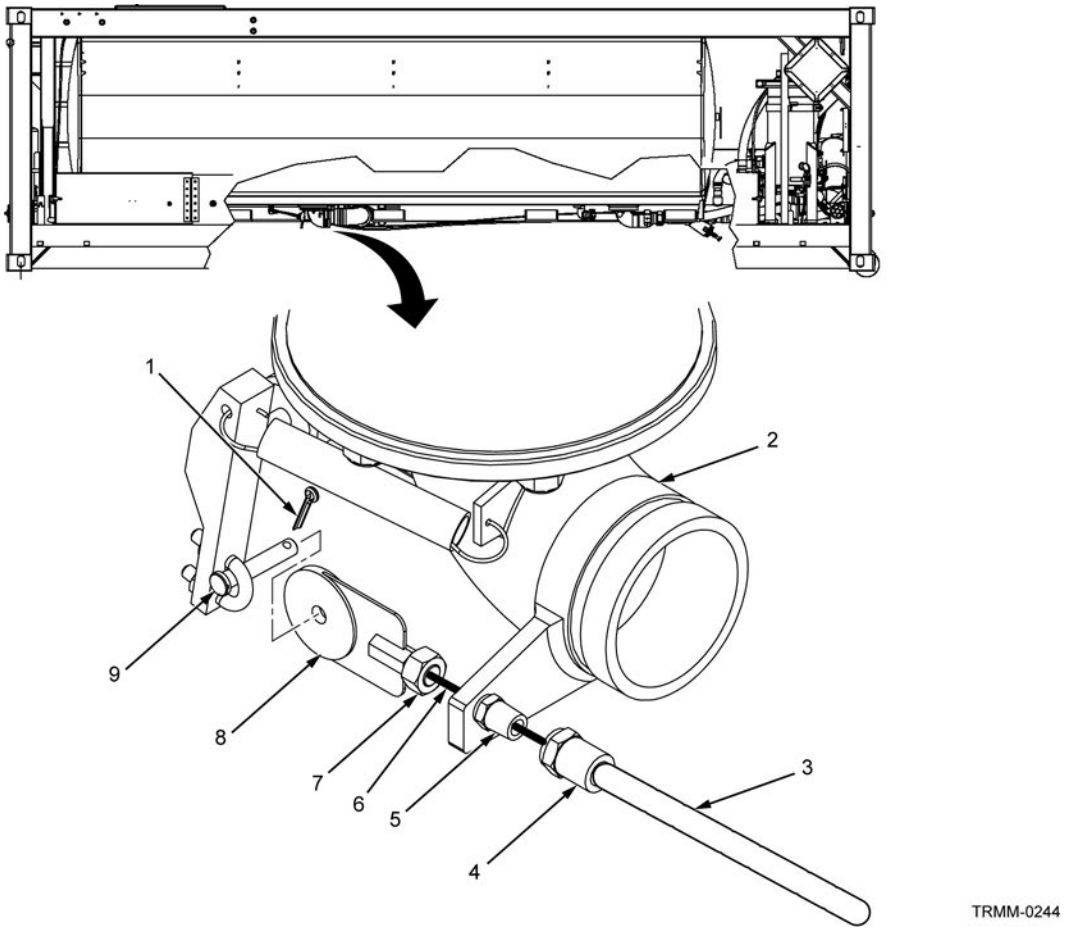


Figure 2. Disconnecting Bottom Loading Valve (V1) Control Cable.

8. Remove two nuts (Figure 3, Item 13) and two bolts (Figure 3, Item 11), and remove coupling halves (Figure 3, Item 12) from bottom loading valve (V1) assembly (Figure 3, Item 8) and reducer (Figure 3, Item 14).
9. Slide coupling gasket (Figure 3, Item 10) onto bottom loading valve (V1) assembly (Figure 3, Item 8).

REMOVAL - Continued

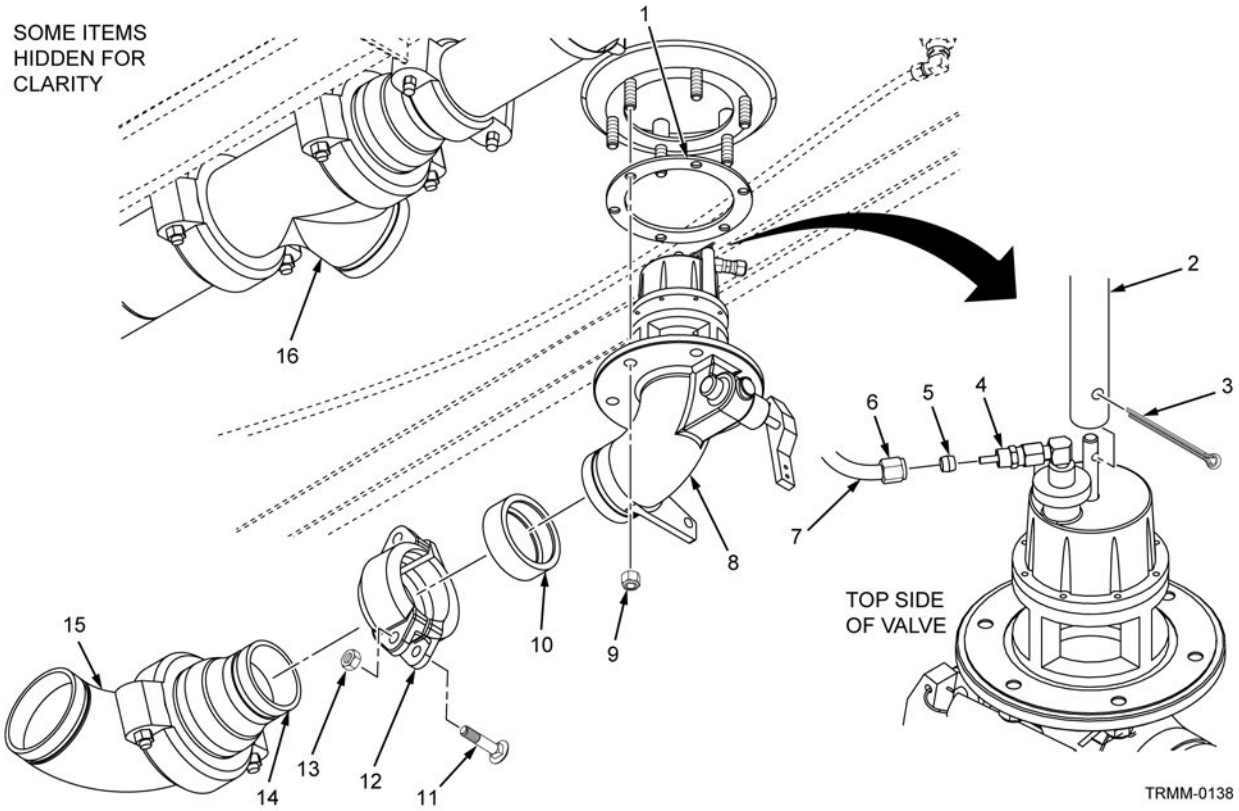


Figure 3. Removing Bottom Loading Valve (V1).

10. Remove reducer (Figure 3, Item 14) and elbow (Figure 3, Item 15) together as an assembly.
11. Remove and discard coupling gaskets from tee (Figure 3, Item 16) and bottom loading valve (V1) assembly (Figure 3, Item 8).

CAUTION

Use caution not to damage jet level sensor hose or actuating rod when lowering bottom loading valve (V1). Failure to comply may cause damage to equipment.

NOTE

Note orientation of bottom loading valve (V1) prior to removal.

12. Remove six hex nuts (Figure 3, Item 9) and lower bottom loading valve (V1) (Figure 3, Item 8) at an angle enough to access top side of bottom loading valve V1.
13. Remove cotter pin (Figure 3, Item 3), detach actuating rod (Figure 3, Item 2) from top of bottom loading valve (V1) (Figure 3, Item 8) and set actuating rod (Figure 3, Item 2) aside inside tank. Discard cotter pin.
14. Unscrew tube nut (Figure 3, Item 6) and disconnect jet level sensor hose (Figure 3, Item 7) and ferrule (Figure 3, Item 5) from fitting (Figure 3, Item 4), and set jet level sensor hose (Figure 3, Item 7) with ferrule (Figure 3, Item 5) aside inside tank.
15. Remove bottom loading valve (V1) (Figure 3, Item 8) and cork gasket (Figure 3, Item 1). Discard cork gasket.

REMOVAL - Continued

16. Remove drip pan and dispose of fuel IAW unit SOP.

END OF TASK

CLEANING

WARNING

Solvent cleaning compound MIL-PRF-680 Type III is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Keep away from open flames and other sources of ignition. Failure to comply may cause injury to personnel.

1. Remove all buildup of dirt, oil, and debris from all metal parts.
2. Clean all metal parts with a cleaning cloth and solvent cleaning compound.
3. Allow parts to dry thoroughly.

END OF TASK

INSTALLATION

1. Lightly lubricate new coupling gasket (Figure 6, Item 11) with fuel and install on bottom loading valve (V1) (Figure 6, Item 9).
2. Install new cork gasket (Figure 6, Item 2) on bottom loading valve (V1) (Figure 6, Item 9).
3. If jet level sensor hose (Figure 6, Item 8) and tube nut (Figure 6, Item 7) are distorted or damaged, perform the following steps to repair it:
   a. Cut off damaged part of jet level sensor hose (Figure 4, Item 1) and discard with tube nut (Figure 4, Item 2) and ferrule (Figure 4, Item 3).
   b. Slide new tube nut (Figure 4, Item 2) onto jet level sensor hose (Figure 4, Item 1).
   c. Slide new ferrule (Figure 4, Item 3) onto jet level sensor hose (Figure 4, Item 1).

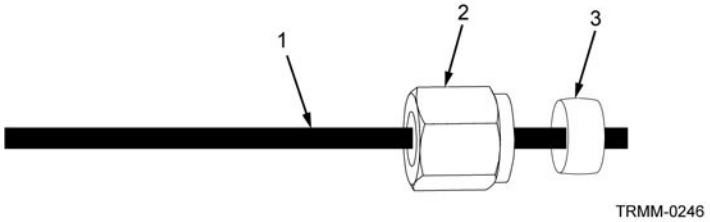


Figure 4. Repairing Jet Level Sensor Hose.

4. Lift bottom loading valve (V1) (Figure 6, Item 9) near tank opening at an angle to allow top of bottom loading valve (V1) to be clear to attach the jet level sensor hose (Figure 6, Item 8) and actuating rod (Figure 6, Item 3).
5. Connect ferrule (Figure 6, Item 6) and jet level sensor hose (Figure 6, Item 8) to fitting (Figure 6, Item 5) and secure with tube nut (Figure 6, Item 7).
6. Attach actuating rod (Figure 6, Item 3) to bottom loading valve (V1) (Figure 6, Item 9) and secure with new cotter pin (Figure 6, Item 4).
7. Install bottom loading valve (V1) (Figure 6, Item 9) on mounting studs (Figure 6, Item 1) as noted during removal.
8. Secure bottom loading valve (V1) (Figure 6, Item 9) using six hex nuts (Figure 6, Item 10). Tighten nuts in standard sequence as shown in Figure 5 to 35 ft-lbs.

INSTALLATION - Continued

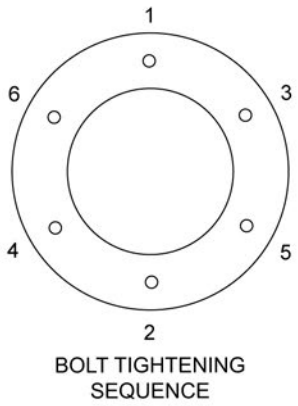


Figure 5. Six Bolt Torque Sequence.

9. Lightly lubricate coupling gasket (Figure 6, Item 20) with fuel and install onto elbow (Figure 6, Item 16) or tee (Figure 6, Item 21).
10. Supporting reducer (Figure 6, Item 15) and elbow (Figure 6, Item 16), lift into place and slide coupling gaskets (Figure 6, Items 11 and 20) onto assembly.
11. Install coupling halves (Figure 6, Items 13 and 19), and loosely secure each with two nuts (Figure 6, Items 14 and 17), and two bolts (Figure 6, Items 12 and 18).
12. Once all pipes and couplings are aligned, tighten all coupling nuts (Figure 6, Items 14 and 17) until coupling halves (Figure 6, Items 13 and 19) are contacting each other on each side.

INSTALLATION - Continued

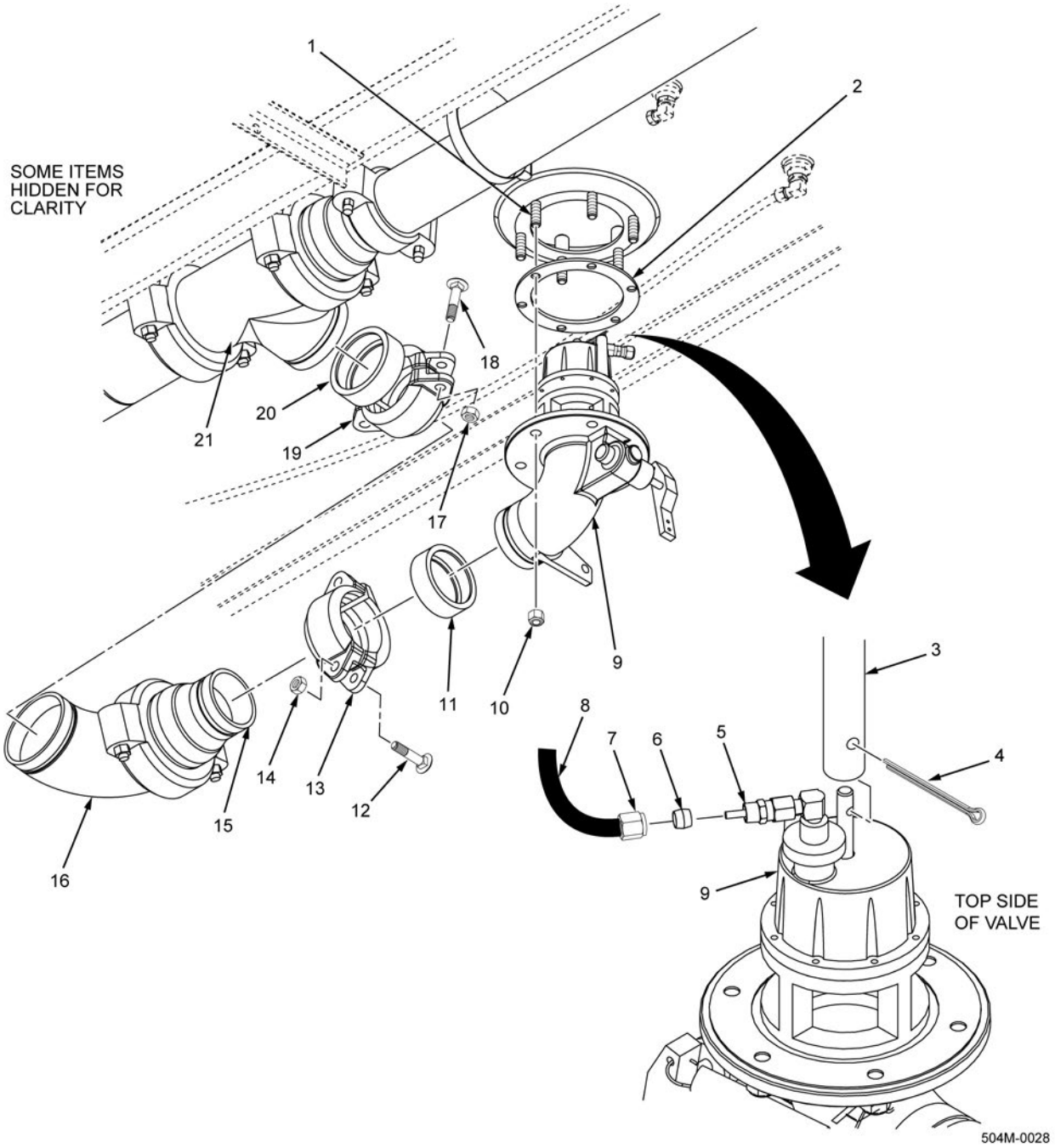


Figure 6. Installing Bottom Loading Valve (V1).

INSTALLATION - Continued

13. Feed cable (Figure 7, Item 4) through brass fitting (Figure 7, Item 5) and connect tube nut (Figure 7, Item 3) to brass fitting (Figure 7, Item 5).
14. Install fusible link as follows:
    a. Install fusible link (Figure 7, Item 6) on pin (Figure 7, Item 1) and secure with new cotter pin (Figure 7, Item 2).
    b. Attach cable (Figure 7, Item 4) to fusible link (Figure 7, Item 6) as follows:
        (1) Insert end of cable (Figure 7, Item 4) through nut (Figure 7, Item 8).
        (2) Lay end of cable (Figure 7, Item 4) into slot (Figure 7, Item 9).
        (3) Slide nut (Figure 7, Item 8) down onto threaded shaft (Figure 7, Item 7) of fusible link (Figure 7, Item 6).

CAUTION

Hold the hex feature on the fusible link with vise grips while tightening the nut. Ensure holding with vise grips firmly or the fusible link will break off very easily.

        (4) Pull cable (Figure 7, Item 4), hand tight, and secure with nut (Figure 7, Item 8).

INSTALLATION - Continued

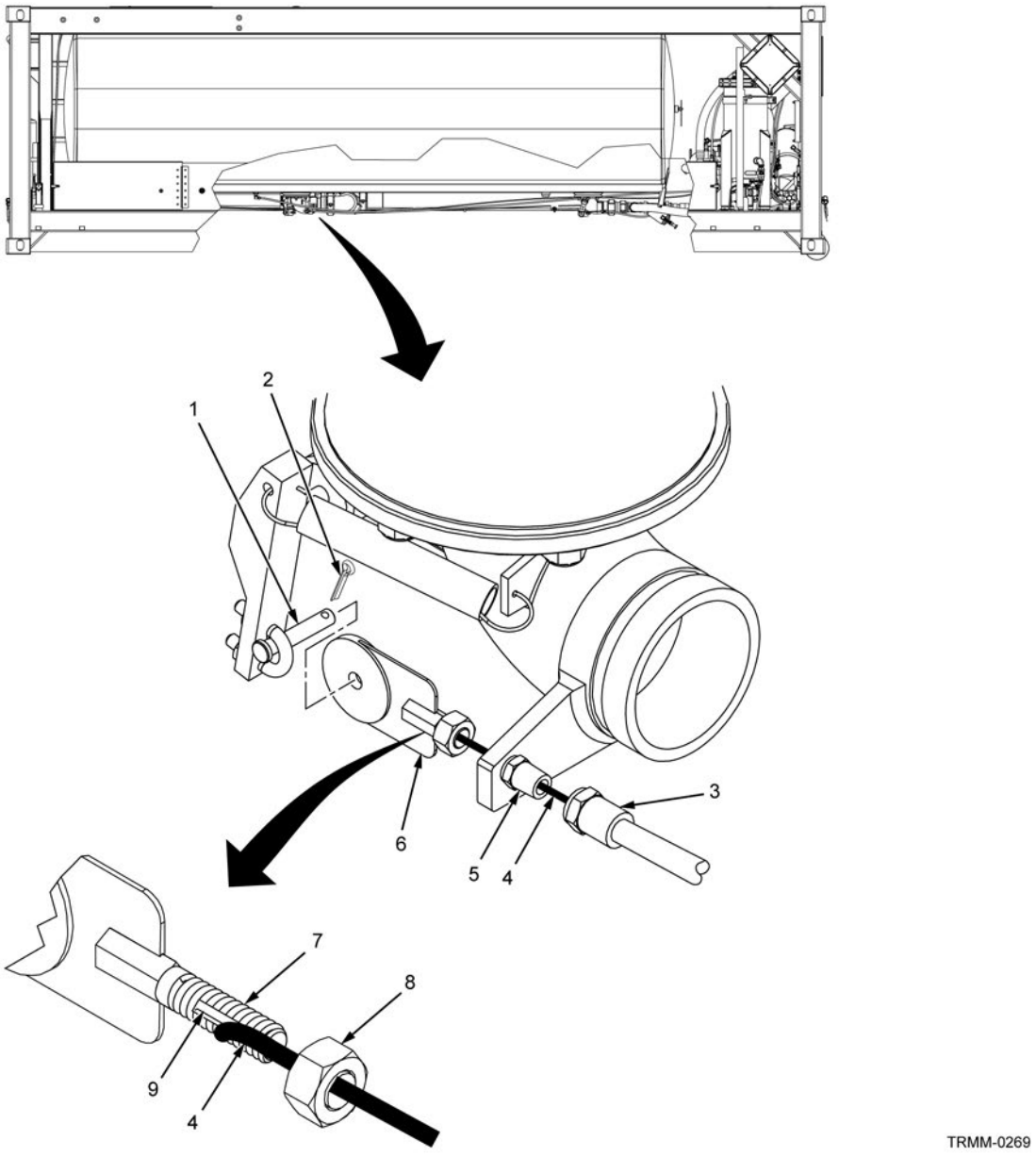


Figure 7. Connecting Bottom Loading Valve (V1) Control Cable.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Adjust bottom loading valve (V1) control cable (WP 0073).
2. Install vent valve (WP 0058).
3. Load MFS TRM with fuel (TM 10-4930-371-10).
4. Check MFS TRM for leaks by recirculating fuel (TM 10-4930-371-10).

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
TANK DISCHARGE VALVE (V2) REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Crow's foot attachment, 3/4" (WP 0217, Table 1, Item 2)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposable nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)
- Pan, drip (WP 0217, Table 1, Item 8)
- Wrench, torque, click, ratcheting, 3/8 inch drive, 20 to 100 lb-ft. (WP 0217, Table 1, Item 23)

Materials/Parts
- Absorbent material (WP 0216, Table 1, Item 1)
- Cleaning compound, solvent (WP 0216, Table 1, Item 3)
- Cloth, cleaning (WP 0216, Table 1, Item 4)
- Cotter pin (WP 0150, Figure 4, Item 11)
- Gasket (WP 0150, Figure 4, Item 4)
- Gasket (WP 0150, Figure 4, Item 6)
- Gasket, cork (WP 0150, Figure 4, Item 3)
- Tank Discharge Valve (V2) (WP 0150, Figure 4, Item 2)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer (2)

References
- ATP 4-43
- TM 10-4930-371-10
- WP 0073

Equipment Condition
- MFS TRM loaded on PLS trailer (TM 10-4930-371-10)
- MFS TRM grounded (TM 10-4930-371-10)
- MFS TRM drained (TM 10-4930-371-10)
- MFS TRM ladder platform emplaced (TM 10-4930-371-10)
- MFS TRM ladder emplaced (TM 10-4930-371-10)

Time to Complete
- 1.5 Hour(s)

REMOVAL

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Failure to comply could result in injury or death to personnel.

REMOVAL - Continued

1. Remove vapor recovery line dust cap (Figure 1, Item 3).
2. Momentarily open then close bottom loading valve (V1) (Figure 1, Item 2) to vent tank pressure.

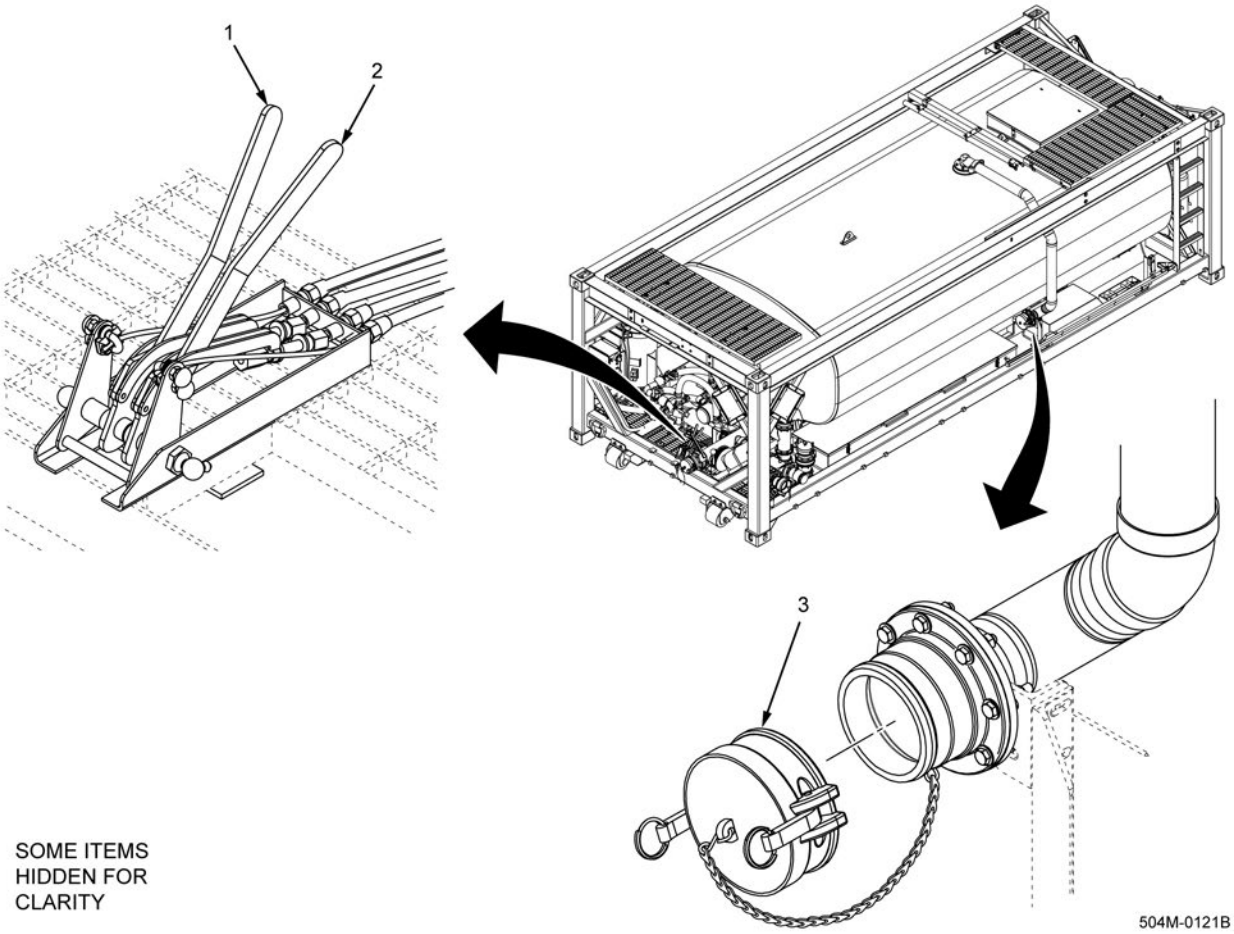


Figure 1. Fuel System Venting.

3. Place drip pan to catch residual fuel as close as possible under strainer assembly (Figure 2, Item 1).
4. Loosen jam nut of strainer (Figure 2, Item 4).
5. Unscrew bolt (Figure 2, Item 3) enough to loosen clamp (Figure 2, Item 2) and cap (Figure 2, Item 5) and allow residual fuel to drain.
6. Slowly open tank discharge valve (V2) control lever (Figure 1, Item 1) to allow fuel to drain completely.

REMOVAL - Continued

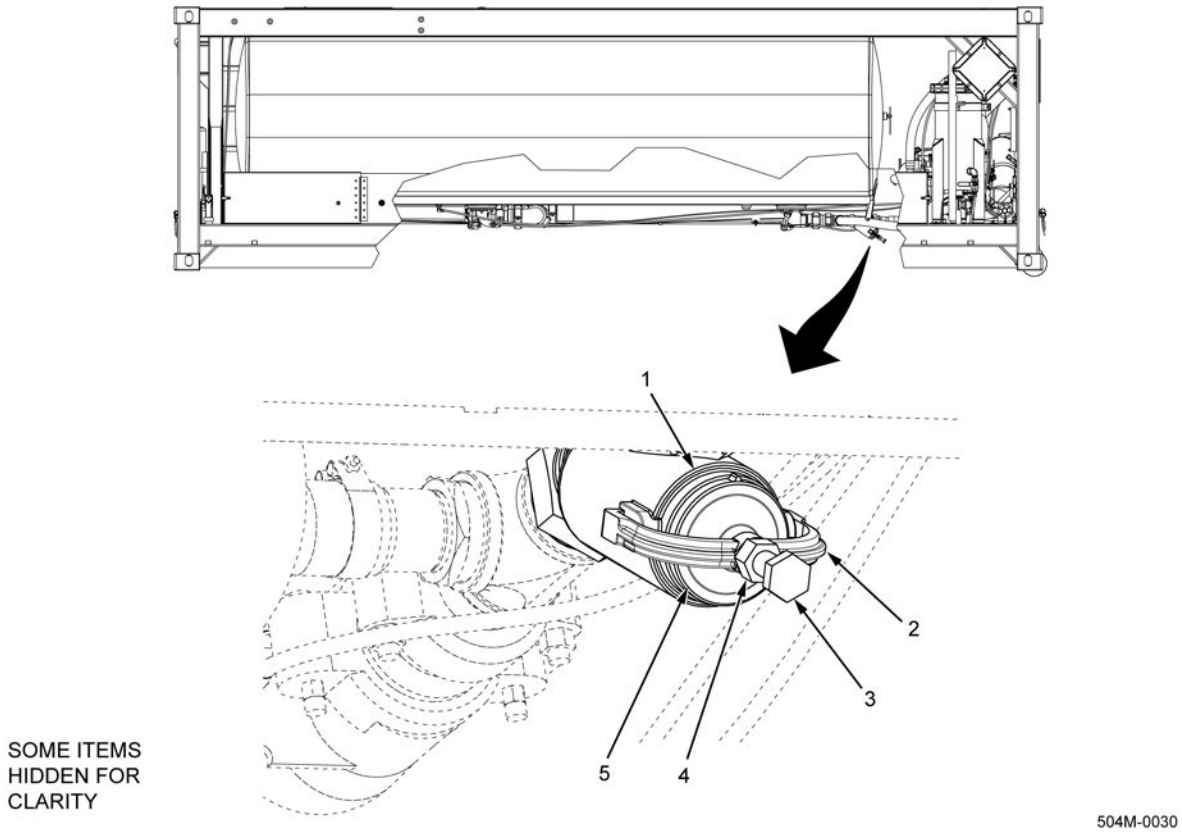


Figure 2. Draining Fuel From Strainer.

7. Close tank discharge valve (V2) (Figure 3, Item 1) by pushing control lever (Figure 3, Item 2) fully forward.
8. Tighten bolt (Figure 2, Item 3) and jam nut (Figure 2, Item 4) after all fuel has been drained.

REMOVAL - Continued

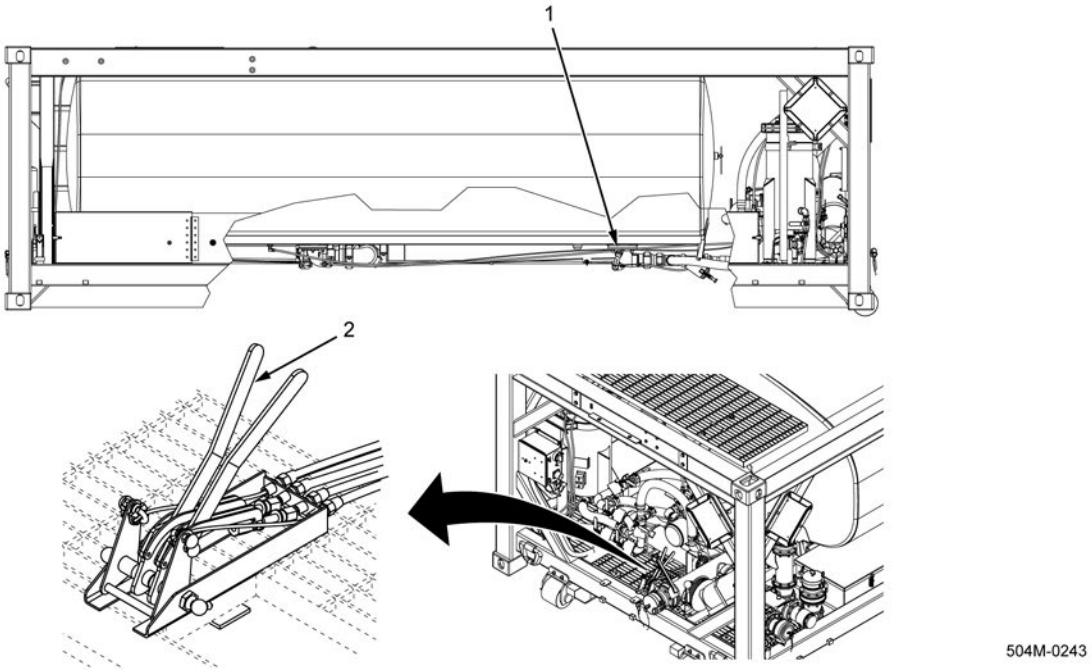


Figure 3. Tank Discharge Valve (V2) and (V2) Control Lever.

9. Loosen locking nut (Figure 4, Item 5) and detach control cable (Figure 4, Item 6) from fusible link (Figure 4, item 4).
10. Remove cotter pin (Figure 4, Item 2) and pin (Figure 4, Item 3) to remove fusible link (Figure 4, Item 4) from tank discharge valve (V2) (Figure 4, Item 1). Discard cotter pin.

REMOVAL - Continued

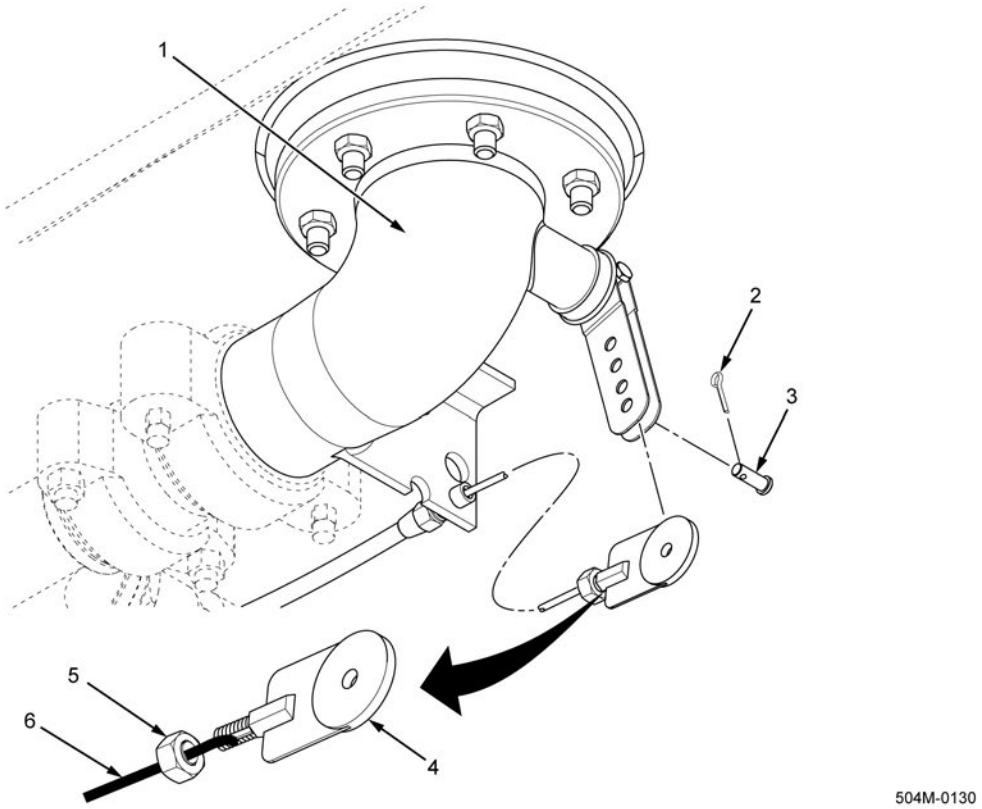


Figure 4. Disconnecting Tank Discharge Valve (V2) Control Cable.

11. Remove two bolts (Figure 5, Item 6) and two nuts (Figure 5, Item 7), and remove coupling halves (Figure 5, Item 8) and coupling gasket (Figure 5, Item 9). Drain residual fuel. Discard gasket.
12. While holding brass fitting (Figure 5, Item 3), disconnect tube nut (Figure 5, Item 4) from brass fitting (Figure 5, Item 3) using care not to damage tubing (Figure 5, Item 5).
13. Pull control cable (Figure 4, Item 6) through brass fitting (Figure 5, Item 3), and clear of tank discharge valve (V2) (Figure 5, Item 2).
14. Remove six nuts (Figure 5, Item 10) and remove tank discharge valve (V2) (Figure 5, Item 2) and gasket (Figure 5, Item 1) from tank. Discard gasket.
15. Remove brass fitting (Figure 5, Item 3) from tank discharge valve (V2) (Figure 5, Item 2). Retain for installation.
16. Remove drip pan and dispose of fuel IAW unit SOP.

REMOVAL - Continued

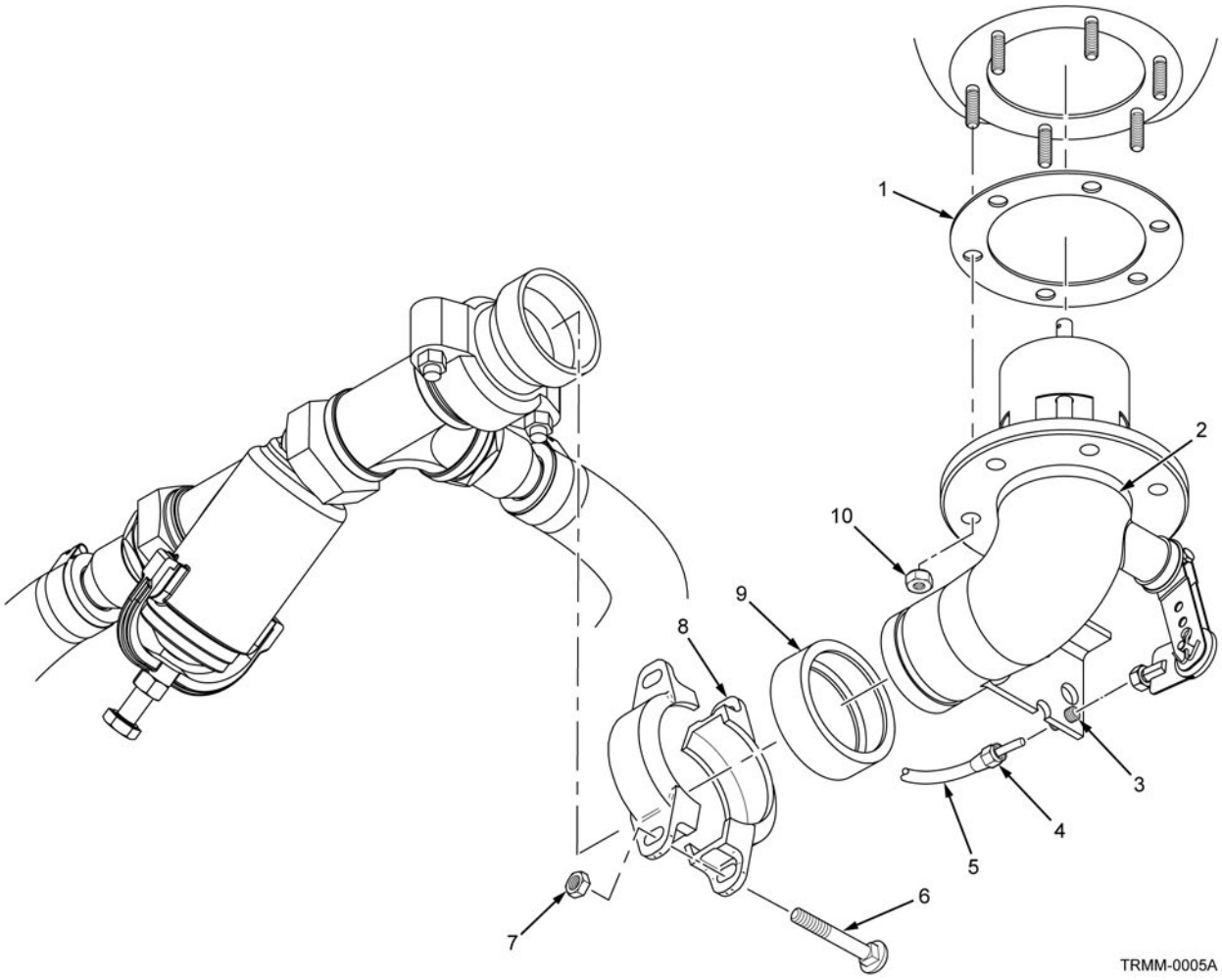


Figure 5. Removing Tank Discharge Valve (V2).

END OF TASK

CLEANING

WARNING

Solvent cleaning compound MIL-PRF-680 Type III is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Keep away from open flames and other sources of ignition. Failure to comply may cause injury to personnel.

1. Remove any residual gasket material from mating surfaces of tank discharge valve (V2) and tank.
2. Remove all dirt, oil, and debris from all mating surfaces and clamping areas.
3. Clean all metal parts with a cleaning cloth and solvent cleaning compound.
4. Allow parts to dry thoroughly.

END OF TASK

INSTALLATION

1. Install brass fitting (Figure 5, Item 3) on tank discharge valve (V2) (Figure 6, Item 4).
2. Install new gasket (Figure 6, Item 3) on tank discharge valve (V2) (Figure 6, Item 4).
3. Lightly lubricate new coupling gasket (Figure 6, Item 9) with fuel and install on tank discharge valve (V2) (Figure 6, Item 4).
4. Lift new tank discharge valve (V2) (Figure 6, Item 4) into position on bolts (Figure 6, Item 2) and align with reducer (Figure 6, Item 1). Secure in place with six nuts (Figure 6, Item 10). Torque bolts to 35 ft-lbs as shown in Figure 7.

INSTALLATION - Continued

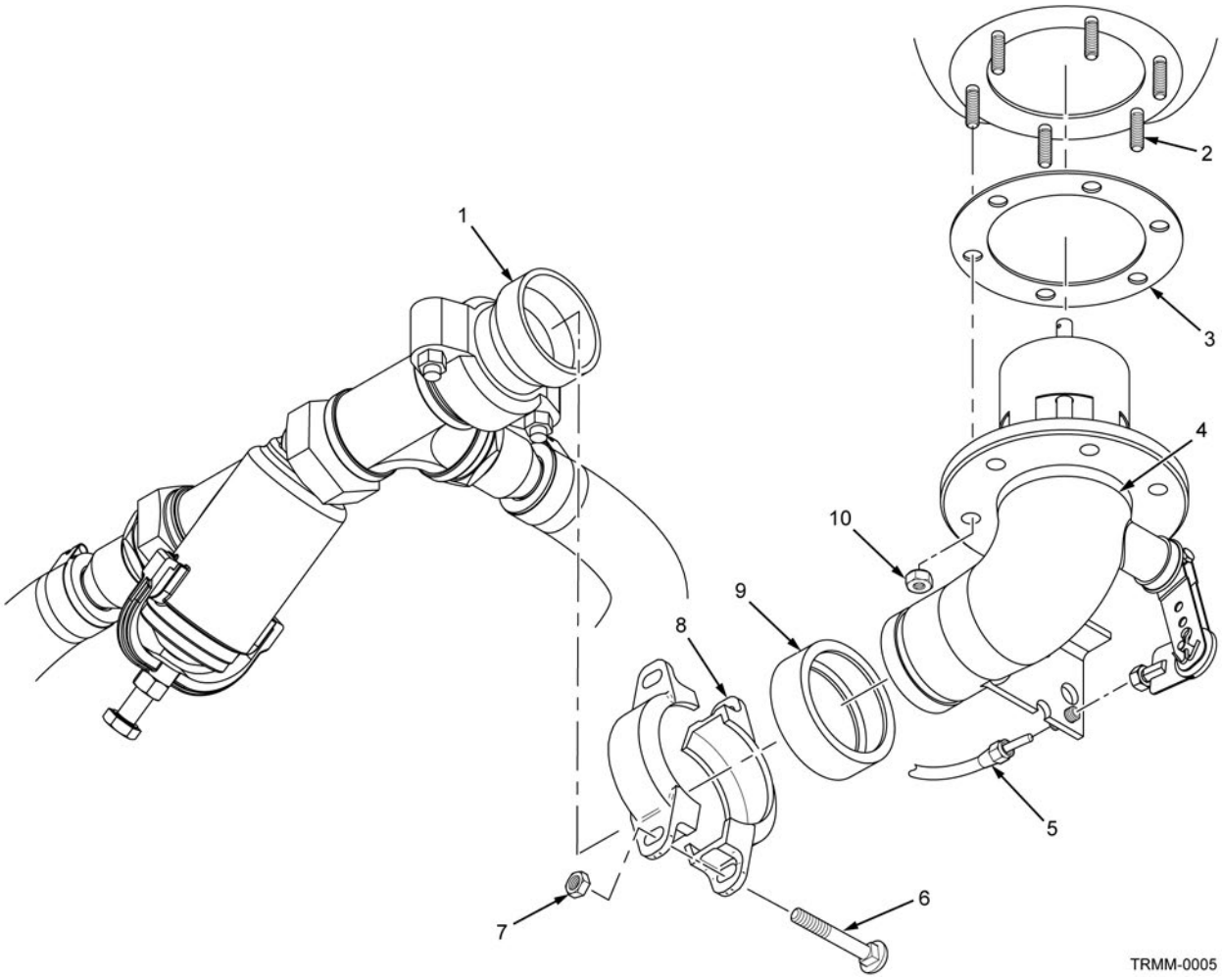


Figure 6. Installing Tank Discharge Valve (V2).

INSTALLATION - Continued

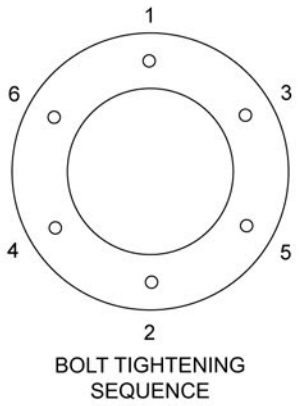


Figure 7. Six-Bolt Torque Sequence.

5. Center coupling gasket over tank discharge valve (V2) (Figure 6, Item 4) and reducer (Figure 6, Item 1).
6. Install coupling halves (Figure 6, Item 8) to connect tank discharge valve (V2) (Figure 6, Item 4) to reducer (Figure 6, Item 1).
7. Install two nuts (Figure 6, Item 7) and bolts (Figure 6, Item 6) to secure coupling halves (Figure 6, Item 8). Tighten nuts (Figure 6, Item 7) until coupling halves (Figure 6, Item 8) are contacting each other on each side.
8. Feed cable (Figure 5, Item 5) through brass fitting (Figure 5, Item 3) and connect tube nut (Figure 5, Item 4) to brass fitting (Figure 5, Item 3).
9. Install fusible link (Figure 8, Item 5) as follows:
   a. Install fusible link (Figure 8, Item 5) and secure with pin (Figure 8, Item 3) and new cotter pin (Figure 8, Item 2).
   b. Attach cable (Figure 8, Item 9) to fusible link (Figure 8, Item 5):
      (1) Insert end of cable (Figure 8, Item 9) through nut (Figure 8, Item 8).
      (2) Lay end of cable (Figure 8, Item 9) into slot (Figure 8, Item 6).
      (3) Slide nut (Figure 8, Item 8) down onto threaded shaft (Figure 8, Item 7) of fusible link (Figure 8, Item 5).

CAUTION

Hold the hex feature on the fusible link with vise grips while tightening the nut. Ensure holding with vise grips firmly or the fusible link will break off very easily.

      (4) Pull cable (Figure 8, Item 9) hand tight and secure with nut (Figure 8, Item 8).

INSTALLATION - Continued

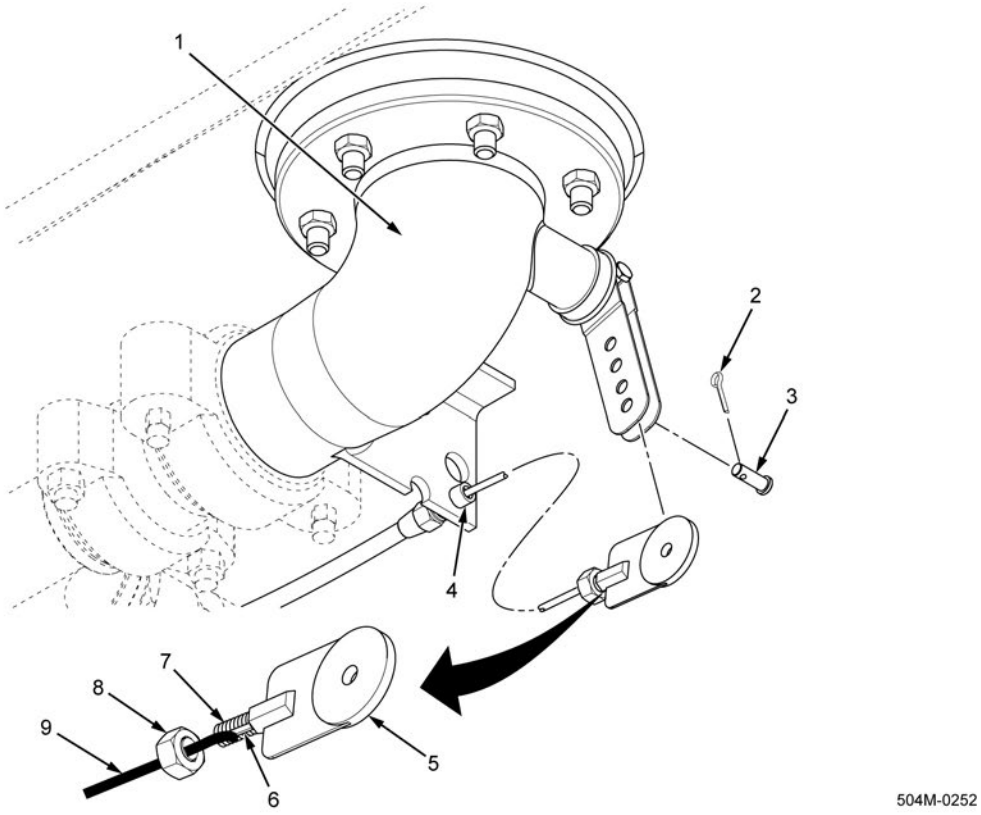


Figure 8. Connecting Tank Discharge Valve (V2) Control Cable.

10. Install vapor recovery line dust cap (Figure 9, Item 1).

INSTALLATION - Continued

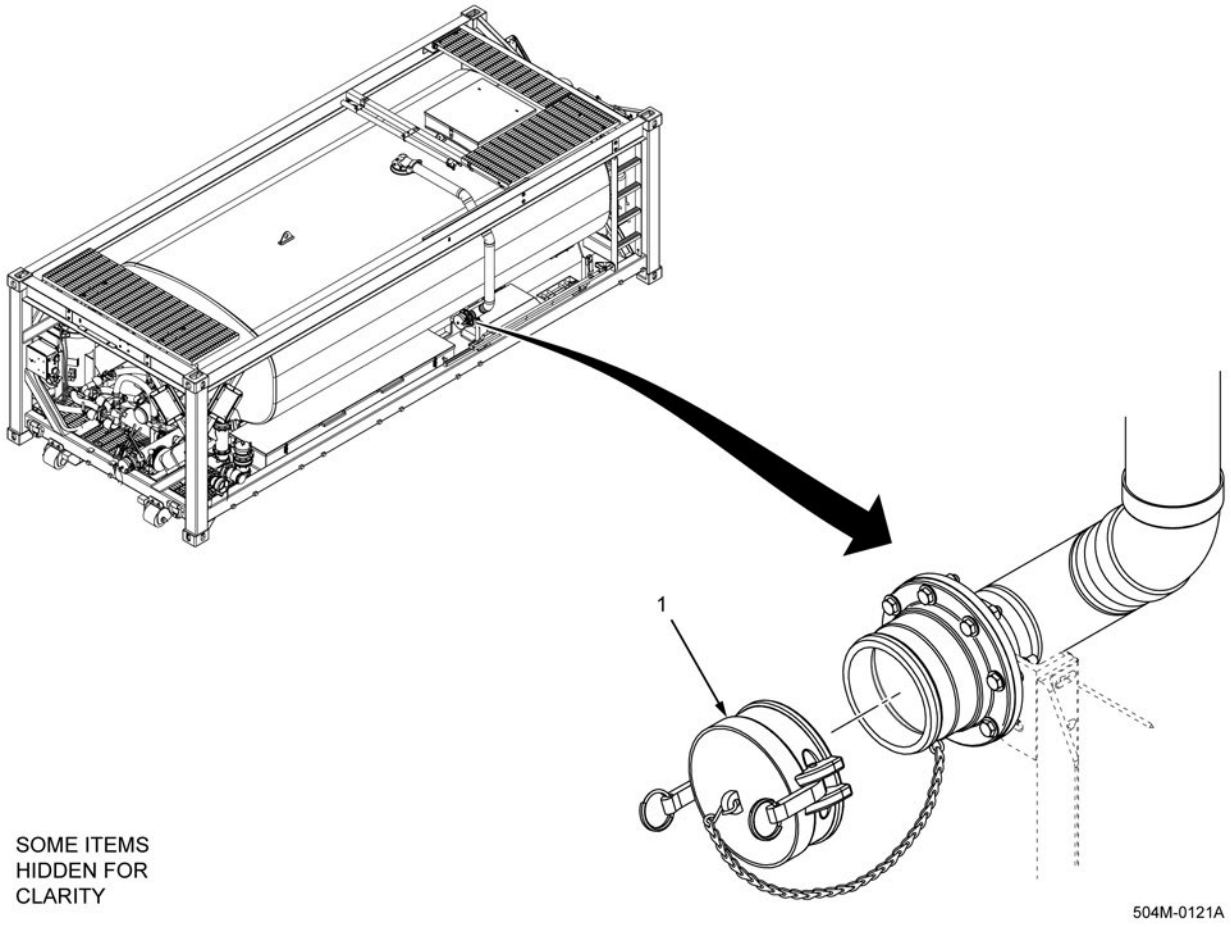


Figure 9. Installing Vapor Recovery Line Dust Cap.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Adjust bottom loading valve (V1) or tank discharge valve (V2) control cable (WP 0073).
2. Load MFS TRM with fuel (TM 10-4930-371-10).
3. Check MFS TRM for leaks by recirculating fuel (TM 10-4930-371-10).

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
FUSIBLE LINK REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool kit, general mechanic's (WP 0217, Table 1, Item 13)

Materials/Parts
(V1) cotter pin (WP 0149, Figure 3, Item 6)
(V2) cotter pin (WP 0150, Figure 4, Item 11)
(V1) Fusible Link (WP 0149, Figure 3, Item 5)
(V2) Fusible Link (WP 0150, Figure 4, Item 12)

Personnel Required
91J Quartermaster and Chemical Equipment Repairer

References
WP 0073

Equipment Condition
MFS TRM mounted on PLS trailer (TM 10-4930-371-10)
MFS TRM grounded (TM 10-4930-371-10)
MFS TRM shut down (TM 10-4930-371-10)
MFS TRM valves closed (TM 10-4930-371-10)

Time to Complete
0.5 Hour(s)

REMOVAL

CAUTION

Hold the hex feature on the fusible link with vise grips while loosening the clamping nut. Ensure holding with vise grips firmly or the fusible link will break off very easily.

1. To remove (V1) fusible link:
   a. Loosen locking nut (Figure 1, Item 7) and detach cable (Figure 1, Item 6) from fusible link (Figure 1, Item 8).
   b. Remove cotter pin (Figure 1, Item 1) and fusible link (Figure 1, Item 8) from clevis pin (Figure 1, Item 9). Discard cotter pin.

REMOVAL - Continued

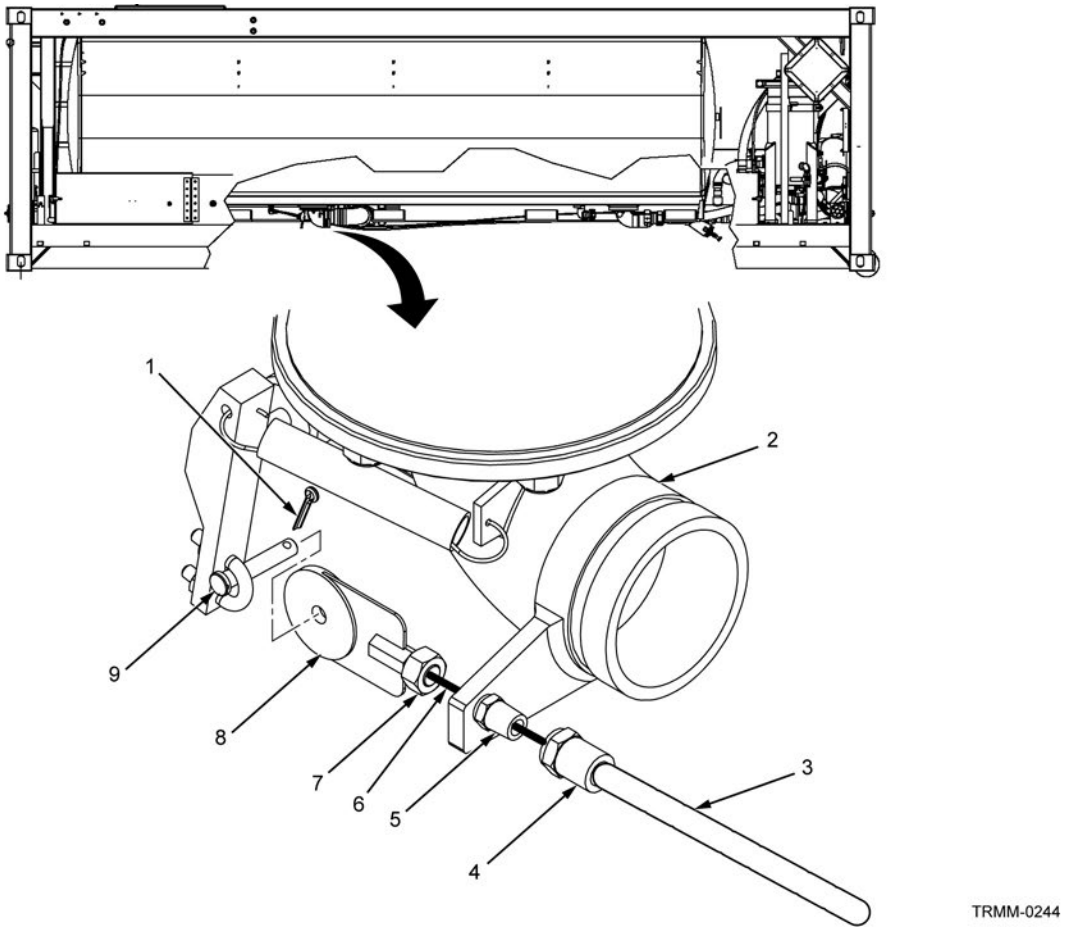


Figure 1. (V1) Fusible Link Replacement.

2. To remove (V2) fusible link:
   a. Loosen locking nut (Figure 2, Item 1) and detach cable (Figure 2, Item 2) from fusible link (Figure 2, Item 4).
   b. Remove cotter pin (Figure 3, Item 2), clevis pin (Figure 3, Item 3), and remove fusible link (Figure 3, Item 4) from (V2) lever (Figure 3, Item 1).

REMOVAL - Continued

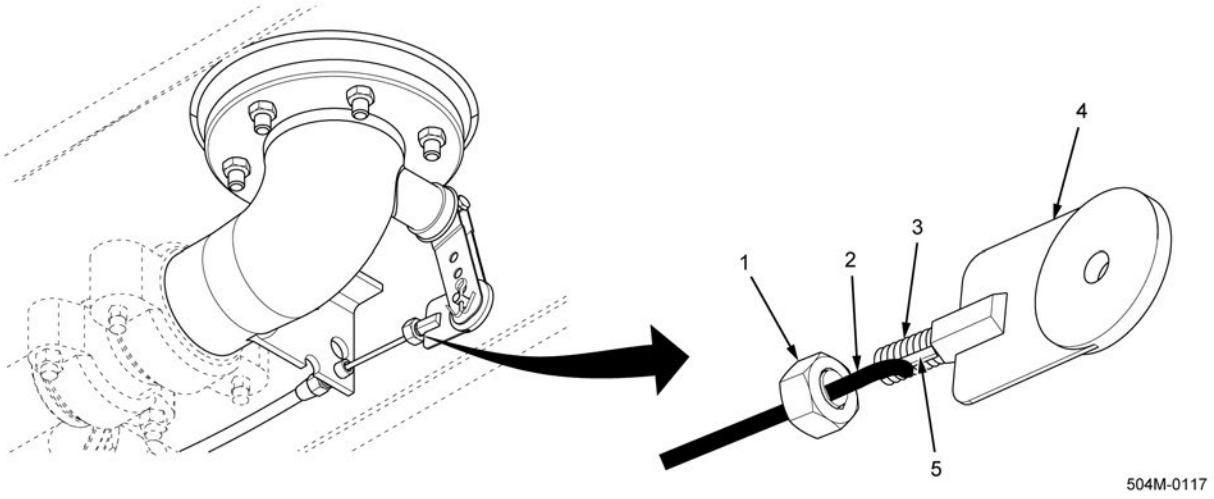


Figure 2. Disconnecting (V2) Fusible Link.

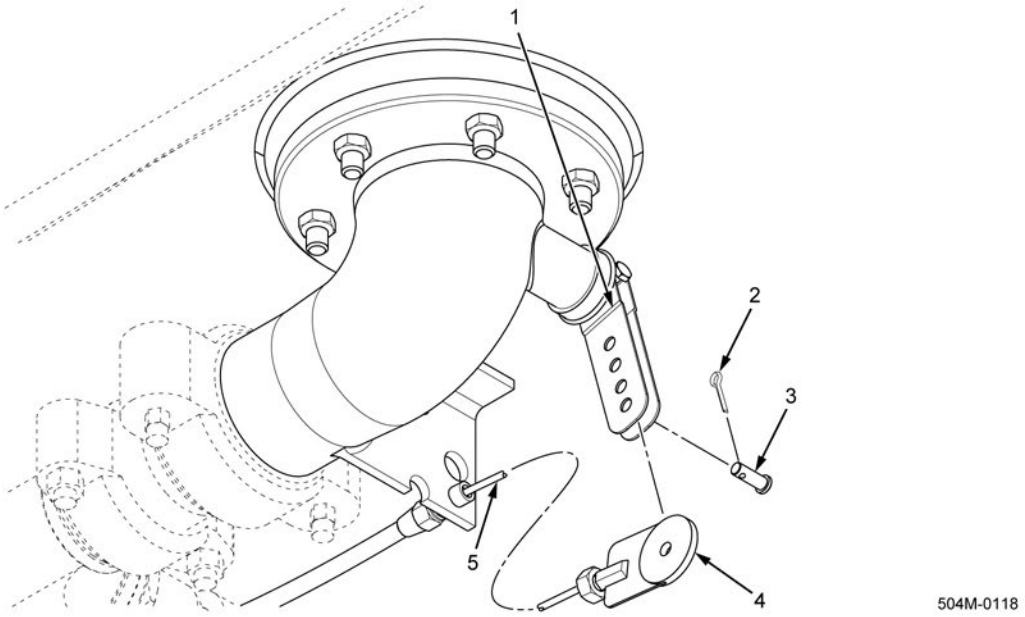


Figure 3. Removing (V2) Fusible Link.

END OF TASK

INSTALLATION

1. To install (V1) fusible link:
   a. Install fusible link (Figure 4, Item 6) on clevis pin (Figure 4, Item 1).
   b. Install cotter pin (Figure 4, Item 2) into clevis pin (Figure 4, Item 1).

INSTALLATION - Continued

c. Remove nut (Figure 4, Item 8) from threaded shaft (Figure 4, Item 7) and insert cable (Figure 4, Item 4) through nut (Figure 4, Item 8), into slot (Figure 4, Item 9) on threaded shaft (Figure 4, Item 7).

d. Loosely install nut (Figure 4, Item 8) on threaded shaft (Figure 4, Item 7).

CAUTION

Hold the hex feature on the fusible link with vise grips while tightening the clamping nut. Ensure holding with vise grips firmly or the fusible link will break off very easily.

e. Pull cable (Figure 4, Item 4) tight until there is no slack, then fully tighten nut (Figure 4, Item 8).

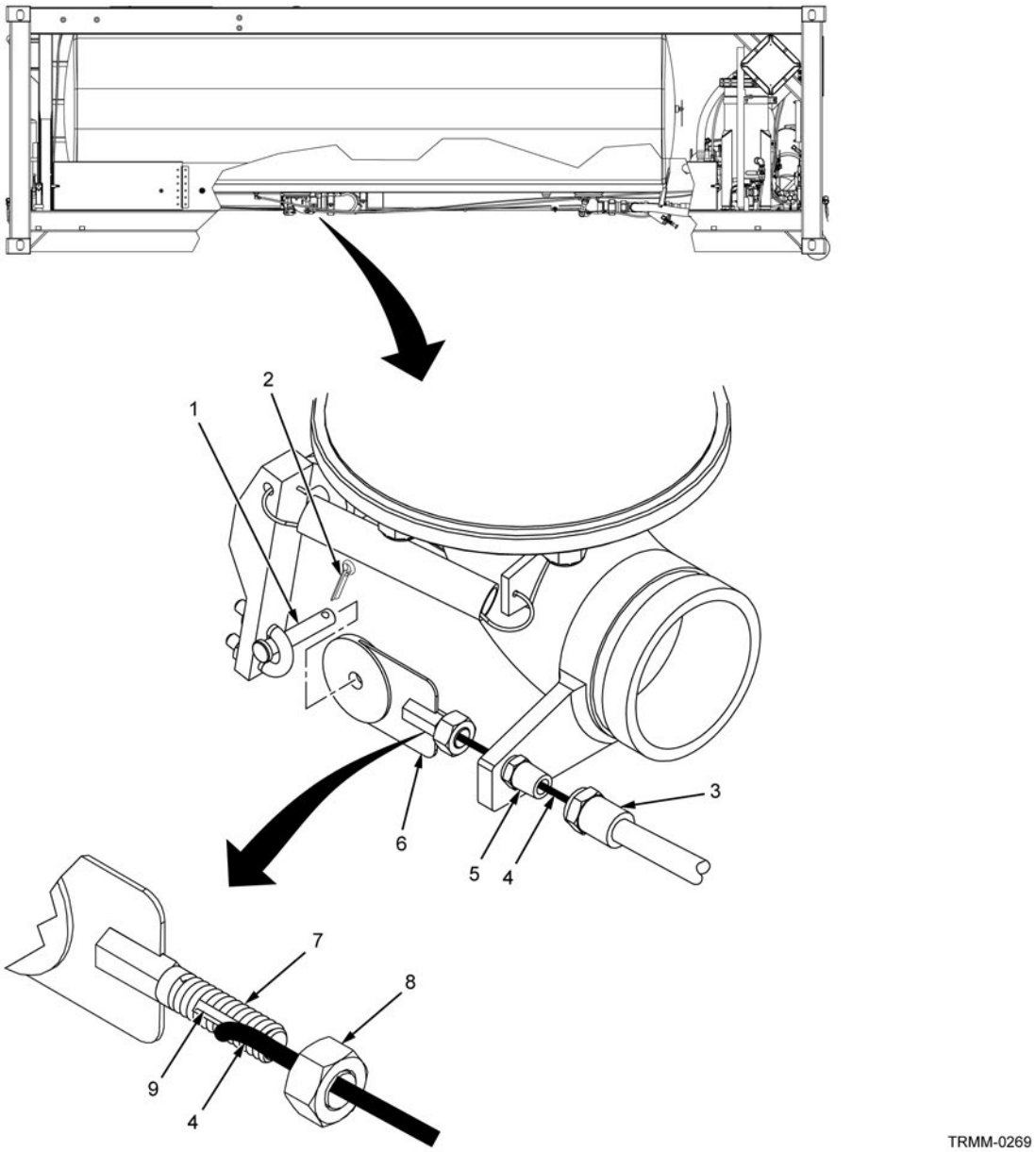


Figure 4. Installing (V1) Fusible Link.

INSTALLATION - Continued

2. To install (V2) fusible link:
   a. Install fusible link (Figure 3, Item 4) into lever (Figure 3, Item 1).
   b. Insert clevis pin (Figure 3, Item 3) through lever arm (Figure 3, Item 1) and fusible link (Figure 3, Item 4).
   c. Install cotter pin (Figure 3, Item 2) into clevis pin (Figure 3, Item 3).
   d. Remove nut (Figure 2, Item 1) from threaded shaft (Figure 2, Item 3) and insert cable (Figure 2, Item 2) through nut (Figure 2, Item 1) into slot (Figure 2, Item 5) on threaded shaft (Figure 2, Item 3).
   e. Loosely install nut (Figure 2, Item 1) on threaded shaft (Figure 2, Item 3).

CAUTION

Hold the hex feature on the fusible link with vise grips while tightening the clamping nut. Ensure holding with vise grips firmly or the fusible link will break off very easily.

   f. Pull cable (Figure 2, Item 2) tight until there is no slack, then fully tighten nut (Figure 2, Item 1).

END OF TASK

FOLLOW-ON MAINTENANCE

Adjust bottom loading valve (V1) or tank discharge valve (V2) (WP 0073).

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
JET LEVEL SENSOR REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposable nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)
- Respirator (WP 0216, Table 1, Item 11)

Materials/Parts
- Absorbent material (WP 0216, Table 1, Item 1)
- Cloth, cleaning (WP 0216, Table 1, Item 4)
- Cleaning compound, solvent (WP 0216, Table 1, Item 3)
- Nut, self-locking, hexagon (LOCKNUTS) (WP 0151, Figure 5, Item 8)
- Jet Level Sensor (WP 0151, Figure 5, Item 6)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer

References
- ATP 4-43
- WP 0053

Equipment Condition
- MFS TRM grounded (TM 10-4930-371-10)
- MFS TRM drained (TM 10-4930-371-10)
- Manhole cover removed (WP 0053)

Time to Complete
- 1.5 Hour(s)

REMOVAL

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Use a drip pan to collect leaking fuel. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the Modular Fuel System Tank Rack Module (MFS TRM) prior to the transfer of fuel.
- Follow all fuel operations IAW ATP 4-43. Ensure grounding and bonding connections are made properly before any fueling operations. Stop fueling operations immediately at the first sign of a leak or malfunction.
- Wet metal surfaces are slippery. Use caution when climbing on top of MFS TRM.
- Ground self and equipment before any fueling operations to prevent explosion caused by electrostatic charge.
- Climbing on top of the MFS TRM presents a fall hazard. Use handrail assembly and handholds at all times and always use “three point contact” with the MFS TRM when climbing on top of the tank to avoid falls. “Three point contact” means that one hand and two feet, or two hands and one foot are in contact with the MFS TRM at all times when climbing on top of the tank. Failure to comply could result in injury or death to personnel.
- Failure to comply could result in injury or death to personnel.

NOTE

Tag and mark tubes to aid in installation.

1. Unscrew tube nuts (Figure 1, Items 2 and 5) and disconnect tubes (Figure 1, Items 1 and 6).

NOTE

Do not let clamp slide down tube.

2. Loosen hose clamp (Figure 1, Item 10) and disconnect tube (Figure 1, Item 9) from jet level sensor (Figure 1, Item 3).
3. Mark threads shown at (Figure 1, Item 4) location of jet level sensor. Do not loosen nut.

REMOVAL - Continued

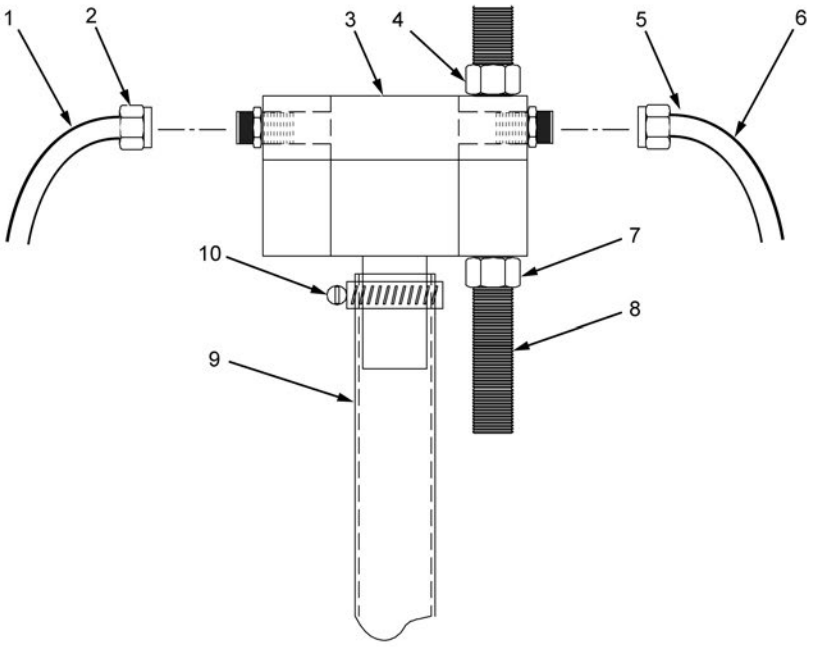


Figure 1. Jet Level Sensor Replacement.

NOTE

Note orientation of jet level sensor to aid in installation of new jet level sensor.

4. Remove locknut (Figure 1, Item 7) and jet level sensor (Figure 1, Item 3) from threaded rod (Figure 1, Item 8). Discard locknut.

END OF TASK

INSTALLATION

NOTE

Install jet level sensor as noted during removal.

1. Install jet level sensor (Figure 1, Item 3) on threaded rod (Figure 1, Item 8) and secure in place with new locknut (Figure 1, Item 7).
2. Connect tube (Figure 1, Item 9) to jet level sensor (Figure 1, Item 3) and secure with hose clamp (Figure 1, Item 10).
3. Connect tubes (Figure 1, Items 1 and 6) to jet level sensor (Figure 1, Item 3) and tighten tube nuts (Figure 1, Items 2 and 5).

END OF TASK

FOLLOW-ON MAINTENANCE

Install manhole cover (WP 0053).

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
MANHOLE COVER ASSEMBLY REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
Fire extinguisher (TM 10-4930-371-10)
Gloves, disposable nitrile (WP 0216, Table 1, Item 5)
Goggles, industrial (WP 0216, Table 1, Item 6)

Materials/Parts
Absorbent material (WP 0216, Table 1, Item 1)
Cover Assembly, Manhole (WP 0152, Figure 6, Item 1)

Personnel Required
91J Quartermaster and Chemical Equipment Repairer

References
ATP 4-43

Equipment Condition
MFS TRM grounded (TM 10-4930-371-10)
MFS TRM shut down (TM 10-4930-371-10)
Handrail and handhold raised (TM 10-4930-371-10)

Time to Complete
0.5 Hour(s)

REMOVAL

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Use a drip pan to collect leaking fuel. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the Modular Fuel System Tank Rack Module (MFS TRM) prior to the transfer of fuel.
- Follow all fuel operations IAW ATP 4-43. Ensure grounding and bonding connections are made properly before any fueling operations. Stop fueling operations immediately at the first sign of a leak or malfunction.
- Wet metal surfaces are slippery. Use caution when climbing on top of MFS TRM.
- Ground self and equipment before any fueling operations to prevent explosion caused by electrostatic charge.
- Climbing on top of the MFS TRM presents a fall hazard. Use handrail assembly and handholds at all times and always use “three point contact” with the MFS TRM when climbing on top of the tank to avoid falls. “Three point contact” means that one hand and two feet, or two hands and one foot are in contact with the MFS TRM at all times when climbing on top of the tank. Failure to comply could result in injury or death to personnel.
- Failure to comply could result in injury or death to personnel.

1. Remove vapor recovery line dust cap (Figure 1, Item 2).
2. Momentarily open then close bottom loading valve (V1) (Figure 1, Item 1) to vent tank pressure.

REMOVAL - Continued

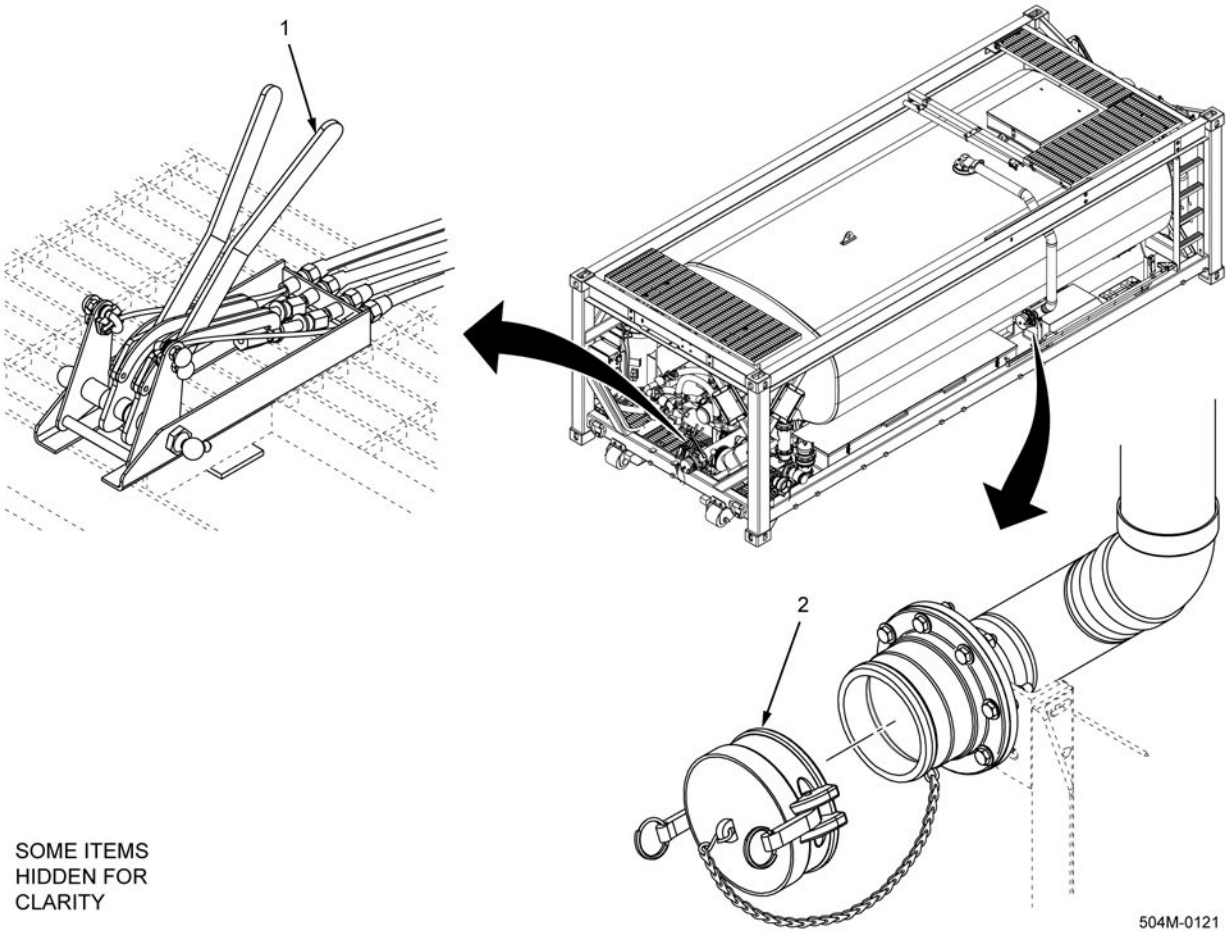


Figure 1. Fuel System Venting.

3. Open spillbox lid (Figure 2, Item 4).
4. Open manhole cover (Figure 2, Item 2) to relieve pressure.
5. Remove nut (Figure 2, Item 1), washer (Figure 2, Item 9), and bolt (Figure 2, Item 7) from clamping ring (Figure 2, Item 8).
6. Remove clamping ring (Figure 2, Item 8) and manhole cover assembly (Figure 2, Item 6) from manhole opening (Figure 2, Item 3).
7. Remove manhole cover assembly gasket (Figure 2, Item 5). Discard gasket.

REMOVAL - Continued

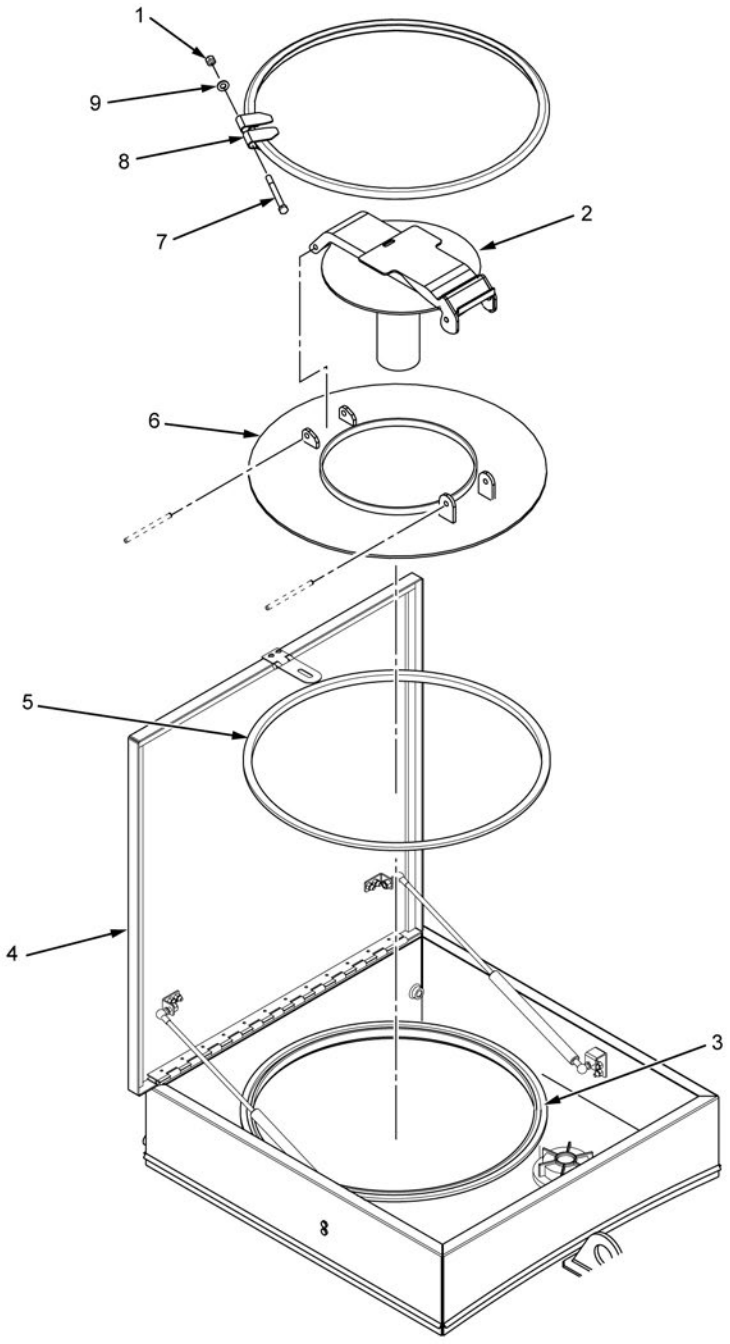


Figure 2. Removing Manhole Cover Assembly and Gaskets.

END OF TASK

INSTALLATION

1. Install manhole cover assembly gasket (Figure 3, Item 6) on manhole opening (Figure 3, Item 4).
2. Position new manhole cover assembly (Figure 3, Item 5) on manhole opening (Figure 3, Item 4).
3. Install clamping ring (Figure 3, Item 8) around new manhole cover assembly (Figure 3, Item 6) and manhole opening (Figure 3, Item 4).
4. Install bolt (Figure 3, Item 7), washer (Figure 3, Item 9) and nut (Figure 3, Item 1) on clamping ring (Figure 3, Item 8).

NOTE

When securing new manhole cover assembly to manhole opening, it might be necessary to tap clamping ring during tightening of nut.

5. Tighten nut (Figure 3, Item 1) to secure new manhole cover assembly (Figure 3, Item 6) to manhole opening (Figure 3, Item 4).
6. Open manhole cover (Figure 3, Item 3).
7. Close manhole cover (Figure 3, Item 3) and secure with latch (Figure 3, Item 2).
8. Close spillbox lid (Figure 2, Item 4).

INSTALLATION - Continued

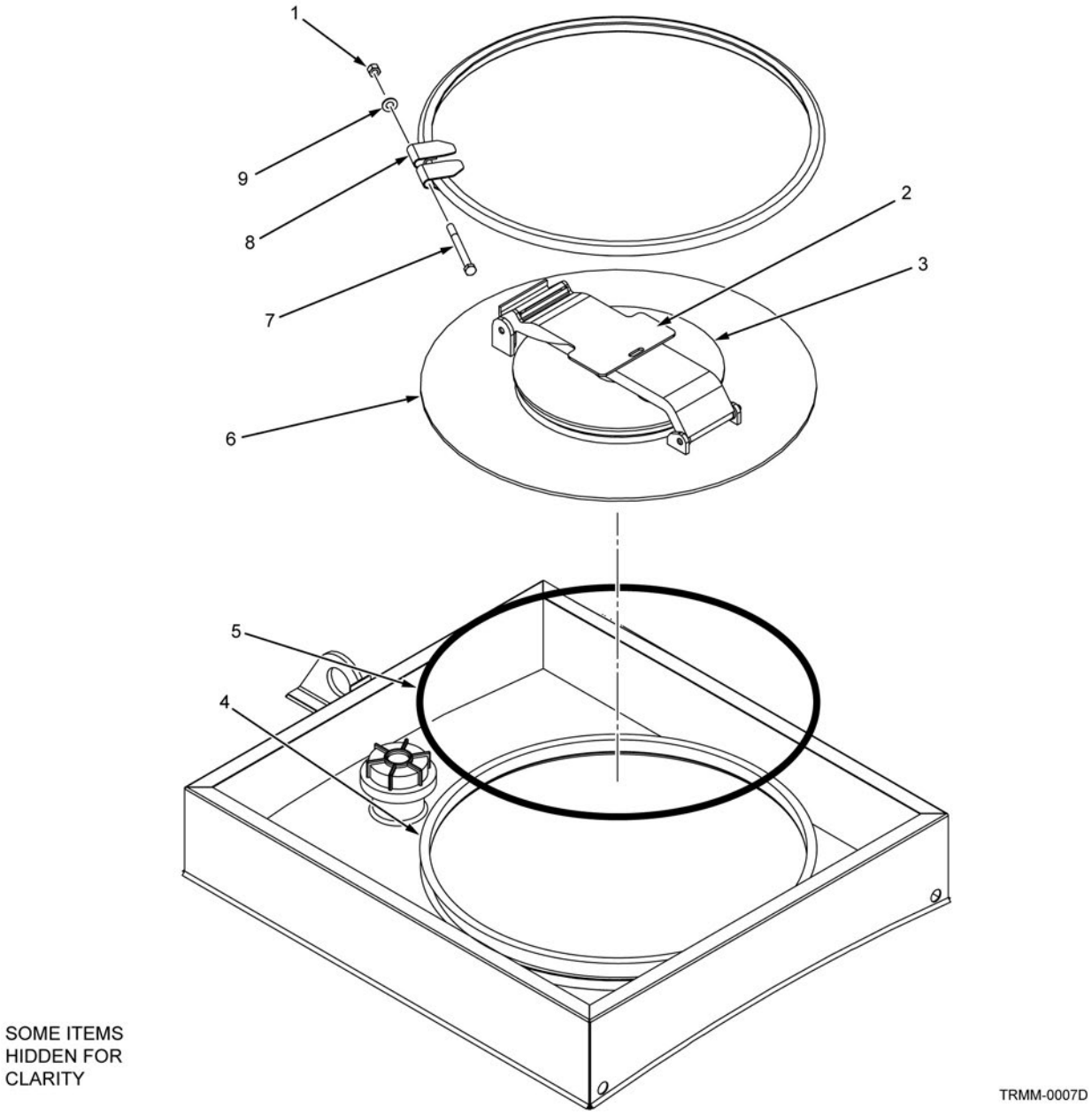


Figure 3. Installing Manhole Cover Assembly and Gaskets.

9. Install vapor recovery line dust cap (Figure 4, Item 1).

INSTALLATION - Continued

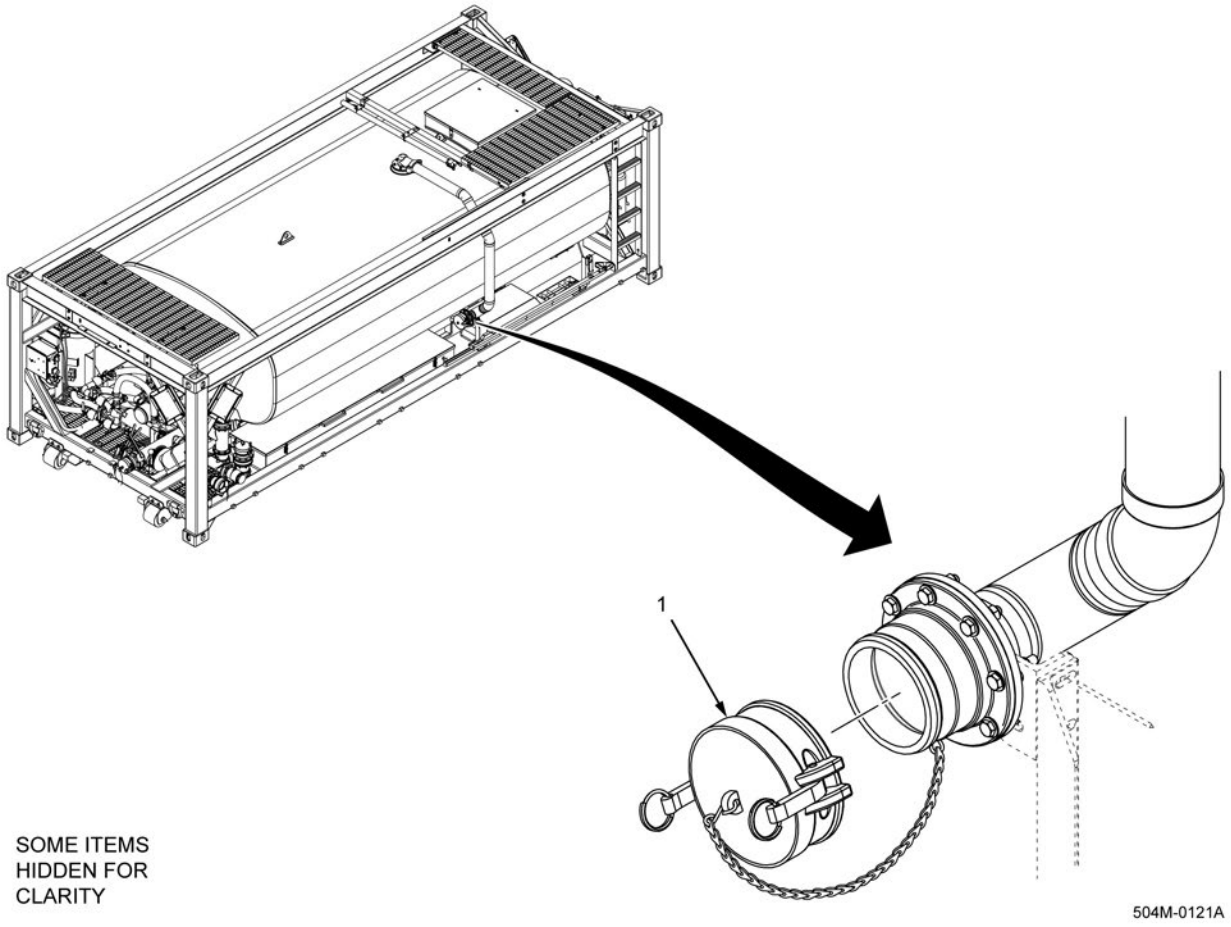


Figure 4. Installing Vapor Recovery Line Dust Cap.

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
MANHOLE COVER FILL PLATE GASKET REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
Fire extinguisher (TM 10-4930-371-10)

Materials/Parts
Petrolatum, technical (WP 0216, Table 1, Item 10)
Gasket (WP 0152, Figure 6, Item 5)

Personnel Required
91J Quartermaster and Chemical Equipment Repairer

Equipment Condition
MFS TRM grounded (TM 10-4930-371-10)

Equipment Condition (cont.)
MFS TRM shut down (TM 10-4930-371-10)
Handrail and handhold raised (TM 10-4930-371-10)

Time to Complete
0.5 Hour(s)

REMOVAL

WARNING

Climbing on top of the MFS TRM presents a fall hazard. Use handrail assembly and handholds at all times and always use "three point contact" with the MFS TRM when climbing on top of the tank to avoid falls. "Three point contact" means that one hand and two feet, or two hands and one foot are in contact with the MFS TRM at all times when climbing on top of the tank. Failure to comply could result in injury or death to personnel.

1. Remove vapor recovery line dust cap (Figure 1, Item 2).
2. Momentarily open then close bottom loading valve V1 (Figure 1, Item 1) to vent tank pressure.

REMOVAL - Continued

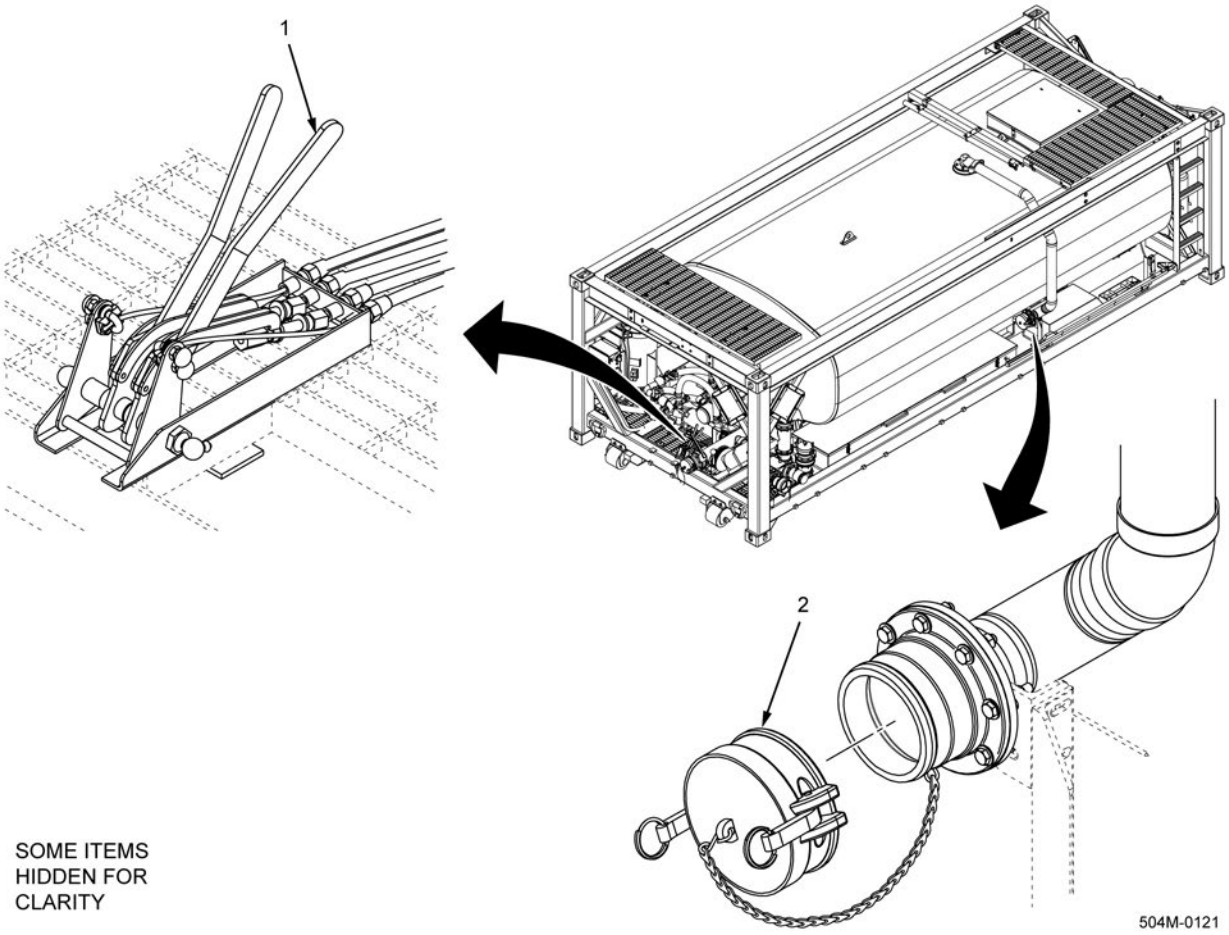


Figure 1. Fuel System Venting.

3. Open spillbox lid (Figure 2, Item 2).
4. Open manhole fill cover (Figure 2, Item 1).
5. Remove manhole cover fill plate gasket (Figure 2, Item 3). Discard gasket.

REMOVAL - Continued

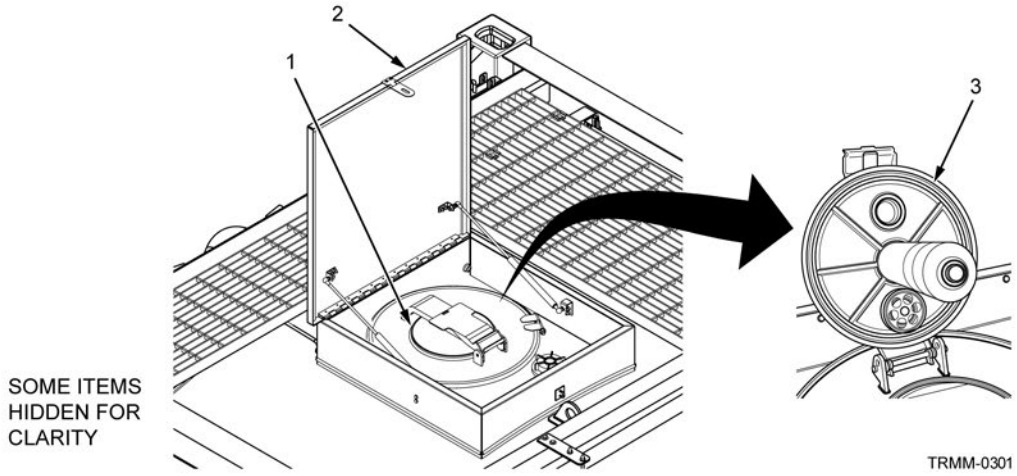


Figure 2. Manhole Cover Fill Plate Gasket Removal.

END OF TASK

CLEANING

WARNING

Solvent cleaning compound MIL-PRF-680 Type III is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Keep away from open flames and other sources of ignition. Failure to comply may cause injury to personnel.

1. Clean all metal parts with a cleaning cloth and solvent cleaning compound.
2. Allow parts to dry thoroughly.

END OF TASK

INSTALLATION

1. Apply petrolatum to new gasket (Figure 2, Item 3).
2. Install new gasket in manhole fill cover (Figure 2, Item 1).
3. Close manhole cover (Figure 2, Item 1).
4. Close spillbox lid (Figure 2, Item 2).
5. Install vapor recovery line dust cap (Figure 3, Item 1).

INSTALLATION - Continued

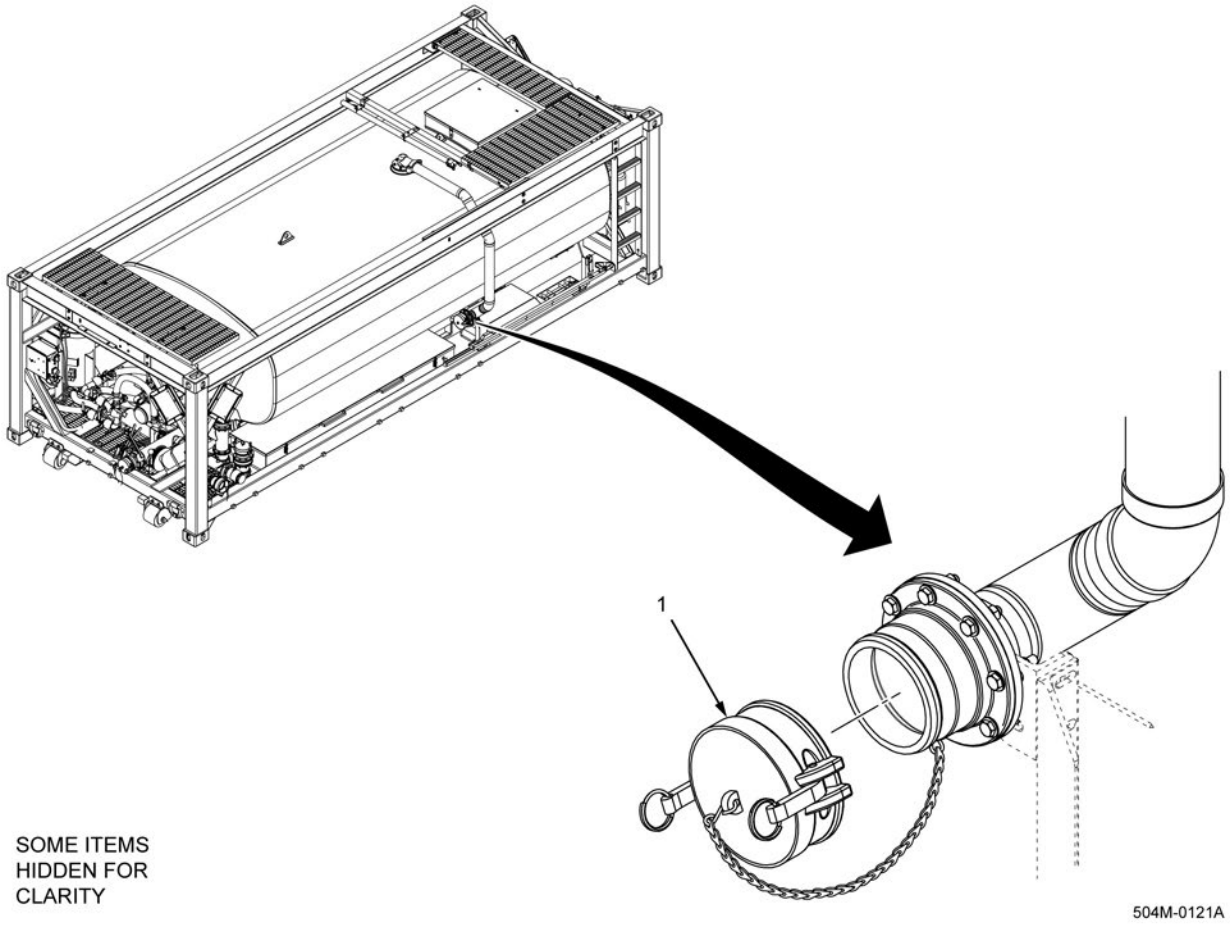


Figure 3. Installing Vapor Recovery Line Dust Cap.

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
SPILLBOX LID ASSEMBLY AND GASKET REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposable nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)
- Respirator (WP 0216, Table 1, Item 11)

Materials/Parts
- Adhesive, multi-purpose (WP 0216, Table 1, Item 2)
- Nut, self-locking, hexagon (LOCKNUTS) Qty: 6 (WP 0153, Figure 7, Item 5)
- Spillbox lid gasket (WP 0153, Figure 7, Item 8)
- Spillbox Lid Assembly (WP 0153, Figure 7, Item 2)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer

Equipment Condition
- MFS TRM grounded (TM 10-4930-371-10)
- MFS TRM shut down (TM 10-4930-371-10)

Time to Complete
- 1.5 Hour(s)

SPILLBOX LID REMOVAL

WARNING

Climbing on top of the MFS TRM presents a fall hazard. Use handrail assembly and handholds at all times and always use "three point contact" with the MFS TRM when climbing on top of the tank to avoid falls. "Three point contact" means that one hand and two feet, or two hands and one foot are in contact with the MFS TRM at all times when climbing on top of the tank. Failure to comply could result in injury or death to personnel.

1. Open spillbox lid (Figure 1, Item 1).

SPILLBOX LID REMOVAL - Continued

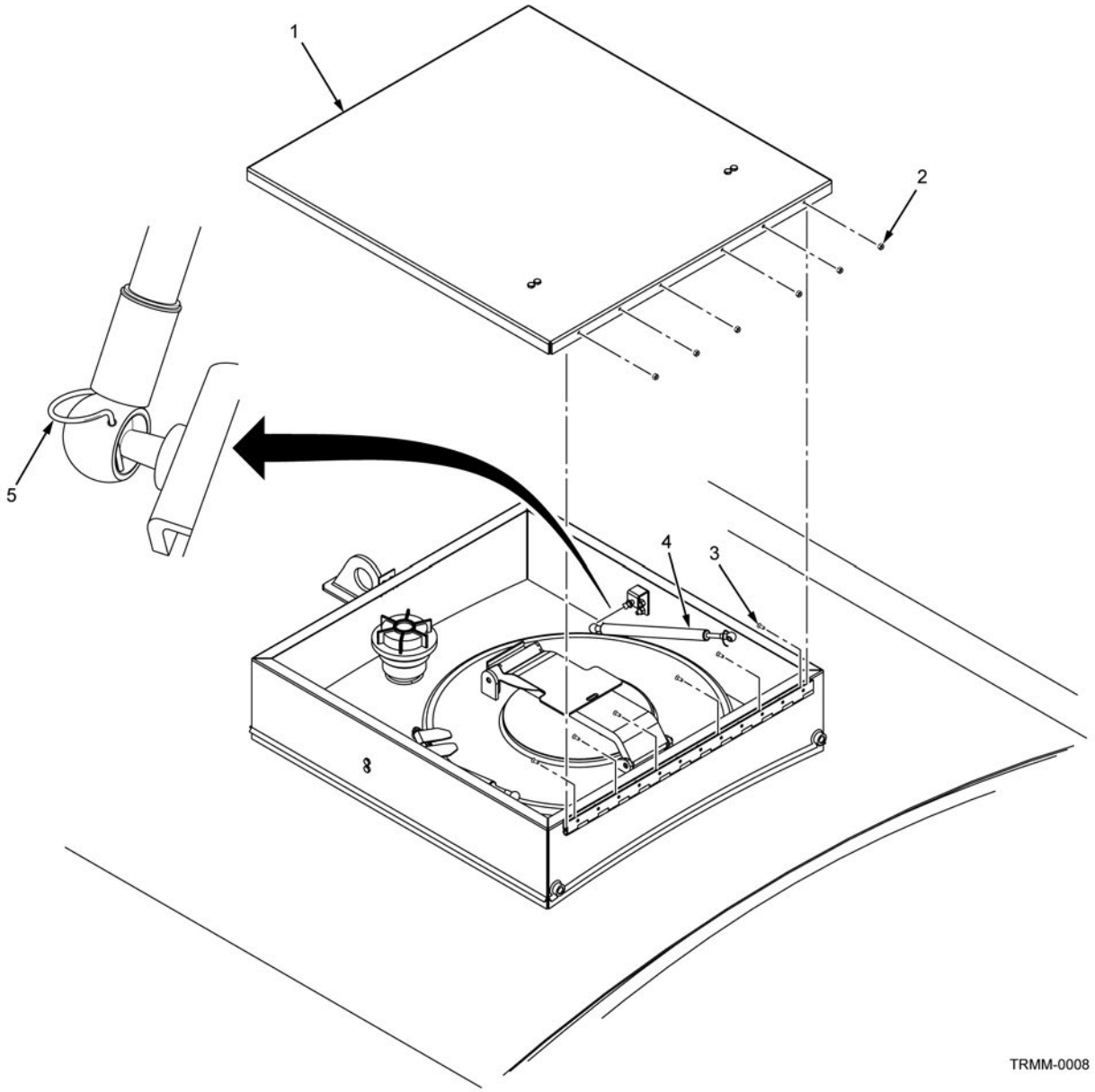


Figure 1. Replacing Spillbox Lid.

2. Remove pins (Figure 1, Item 5) from ends of two gas springs (Figure 1, Item 4) at spillbox lid (Figure 1, Item 1), pry ends off and remove two gas springs (Figure 1, Item 4) from spillbox lid (Figure 1, Item 1).
3. Remove six screws (Figure 1, Item 3), locknuts (Figure 1, Item 2), and spillbox lid (Figure 1, Item 1). Discard locknuts.

END OF TASK

SPILLBOX LID INSTALLATION

1. Install new spillbox lid (Figure 1, Item 1) and secure with six screws (Figure 1, Item 3) and new locknuts (Figure 1, Item 2).
2. Attach loose ends of two gas springs (Figure 1, Item 4) to spillbox lid (Figure 1, Item 1) and secure ends with pins (Figure 1, Item 5).
3. Close spillbox lid (Figure 1, Item 1).

END OF TASK

SPILLBOX LID GASKET REMOVAL

1. Open spillbox lid (Figure 2, Item 1).

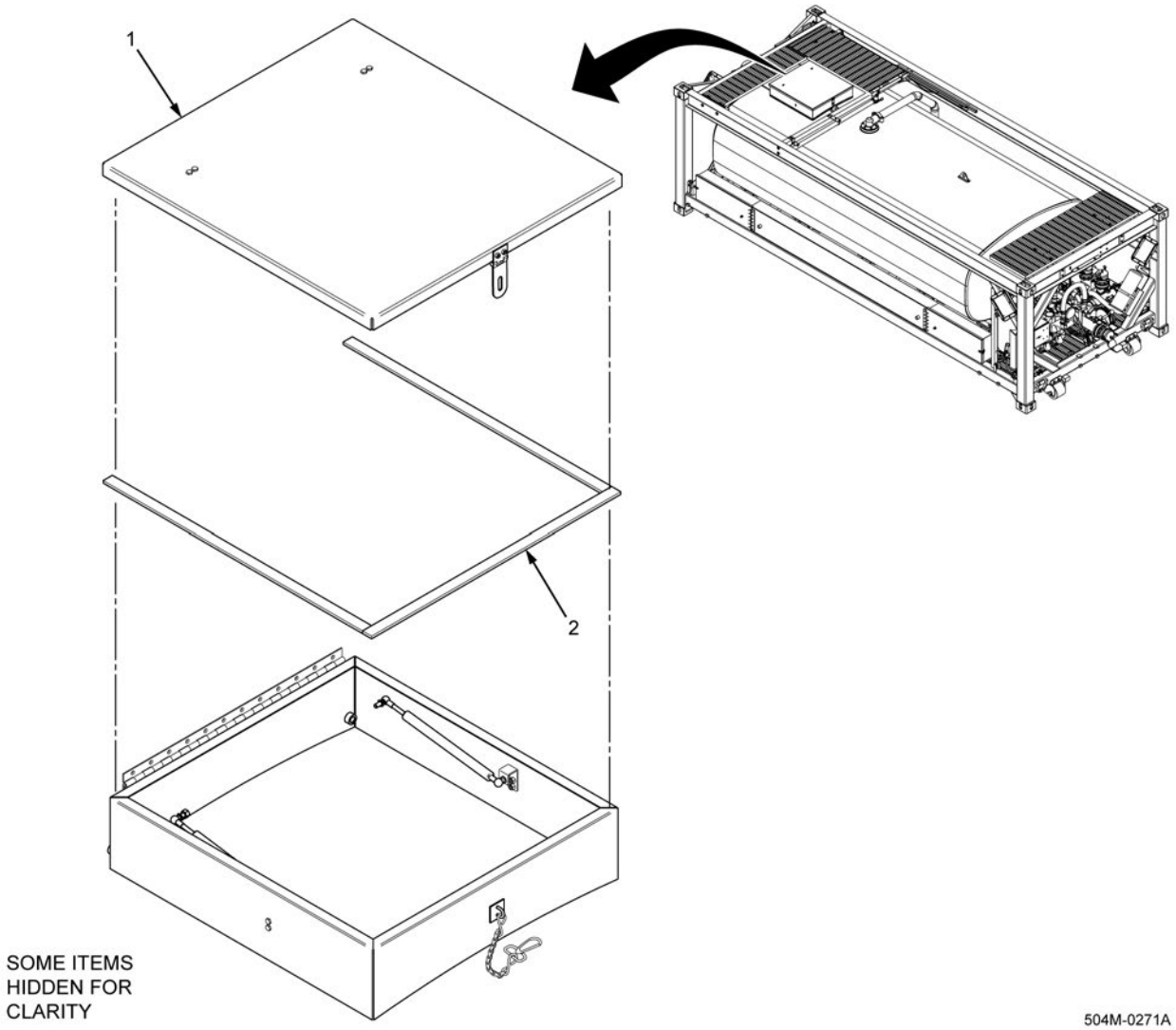


Figure 2. Spillbox Lid Gasket.

SPILLBOX LID GASKET REMOVAL - Continued

WARNING

- Ensure work is completed in a well-ventilated, non-enclosed space.
- Do not sand, grind, or heat surface of MFS TRM. Failure to comply could result in injury or death to personnel.

NOTE

Note orientation of gasket pieces to aid in installation.

2. Remove gasket material (Figure 2, Item 2) from lid (Figure 2, Item 1).
3. Remove remaining residual gasket material.

END OF TASK

SPILLBOX LID GASKET INSTALLATION

WARNING

- Adhesive may cause irritation or discomfort to the eyes, skin, nose and throat and should not be ingested. Safety glasses, goggles, rubber gloves and aprons should be worn when handling. Clean-up materials and applicators should be recycled or disposed of IAW local protocol. Failure to comply may cause injury to personnel and damage to the environment.
- Do not sand or burn surfaces of MFS TRM. Failure to comply could result in death or serious injury.

1. Apply adhesive to back surface of gasket (Figure 2, Item 2).
2. Install gasket (Figure 2, Item 2) on spillbox lid (Figure 2, Item 1).
3. Allow adhesive to dry completely.
4. Close spillbox lid (Figure 2, Item 1).

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
SPILLBOX LID GAS SPRING REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
Fire extinguisher (TM 10-4930-371-10)

Materials/Parts
Spring, Gas (WP 0153, Figure 7, Item 11)

Personnel Required
91J Quartermaster and Chemical Equipment Repairer

Equipment Condition
MFS TRM grounded (TM 10-4930-371-10)
MFS TRM shut down (TM 10-4930-371-10)

Time to Complete
0.2 Hour(s)

REMOVAL

WARNING

Climbing on top of the MFS TRM presents a fall hazard. Use handrail assembly and handholds at all times and always use "three point contact" with the MFS TRM when climbing on top of the tank to avoid falls. "Three point contact" means that one hand and two feet, or two hands and one foot are in contact with the MFS TRM at all times when climbing on top of the tank. Failure to comply could result in injury or death to personnel.

NOTE

Note orientation of hardware and components to aid in installation.

1. Open spillbox lid (Figure 1, Item 1).
2. Remove locking pins (Figure 1, Item 3) from each gas spring end socket (Figure 1, Item 2) to release gas spring end from both mounting studs (Figure 1, Item 4).
3. Carefully pry both ends of gas spring (Figure 1, Item 5) from mounting studs (Figure 1, Item 4).

REMOVAL - Continued

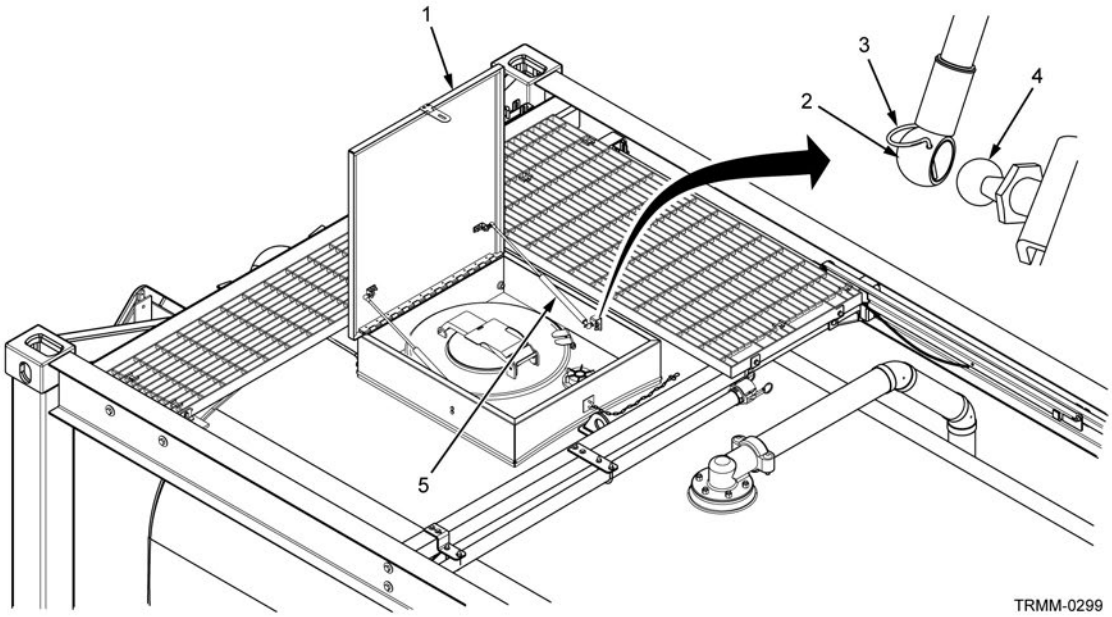


Figure 1. Spillbox Lid Air Spring Replacement.

END OF TASK

INSTALLATION

1. Push ends of gas spring (Figure 1, Item 5) onto mounting studs (Figure 1, Item 4).
2. Insert locking pins (Figure 1, Item 3) onto each end to lock into place.
3. Close spillbox lid (Figure 1, Item 1).

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
SPILLBOX DRAIN LINES REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposable nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)
- Pan, drip (WP 0217, Table 1, Item 8)
- Vise, machinist's (WP 0217, Table 1, Item 14)

Materials/Parts
- Absorbent material (WP 0216, Table 1, Item 1)
- Cleaning compound, solvent (WP 0216, Table 1, Item 3)
- Cloth, cleaning (WP 0216, Table 1, Item 4)
- Sealing compound (WP 0216, Table 1, Item 13)
- Thread sealing compound (WP 0216, Table 1, Item 15)

Materials/Parts (cont.)
- Drain, line (WP 0153, Figure 7, Item 24)
- Drain, line (WP 0153, Figure 7, Item 25)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer

References
- ATP 4-43

Equipment Condition
- MFS TRM grounded (TM 10-4930-371-10)
- MFS TRM shut down (TM 10-4930-371-10)

Time to Complete
- 1.0 Hour(s)

REMOVAL

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Climbing on top of the MFS TRM presents a fall hazard. Use handrail assembly and handholds at all times and always use “three point contact” with the MFS TRM when climbing on top of the tank to avoid falls. “Three point contact” means that one hand and two feet, or two hands and one foot are in contact with the MFS TRM at all times when climbing on top of the tank. Failure to comply could result in injury or death to personnel.
- Failure to comply could result in injury or death to personnel.

REMOVAL - Continued

NOTE

- Remove only those items necessary to accomplish desired replacement.
- Note orientation of hardware and components to aid in installation.

1. Place drip pan under drain valve (Figure 1, Item 8) to catch residual fuel.
2. Open drain valve (Figure 1, Item 8) and drain any fuel from drain line.
3. Dispose of fuel IAW unit SOP.
4. Remove snap grip clips (Figure 1, Item 6).
5. Unscrew drain valve (Figure 1, Item 8) from nipple (Figure 1, Item 9).
6. Remove elbow (Figure 1, Item 7) from drain valve (Figure 1, Item 8).
7. Disconnect tube nuts (Figure 1, Item 4) from fitting (Figure 1, Item 2), and elbow (Figure 1, Item 12) then remove drain line (Figure 1, Item 5). Remove and discard tube ferrules (Figure 1, Item 3) and drain line (Figure 1, Item 5) if needed.
8. If necessary, remove fitting (Figure 1, Item 2) from coupling (Figure 1, Item 1) or nipple (Figure 1, Item 9) from bulkhead fitting (Figure 1, Item 10).
9. If necessary, remove elbow (Figure 1, Item 12) from bulkhead fitting (Figure 1, Item 10).
10. If necessary, remove nut (Figure 1, Item 11) from bulkhead fitting (Figure 1, Item 10) and remove bulkhead fitting.

END OF TASK

CLEANING

WARNING

Solvent cleaning compound MIL-PRF-680 Type III is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Keep away from open flames and other sources of ignition. Failure to comply may cause injury to personnel.

1. Clean any residual thread sealant from threads of all components.
2. Clean all metal parts with a cleaning cloth and solvent cleaning compound.
3. Allow parts to dry thoroughly.

END OF TASK

INSTALLATION

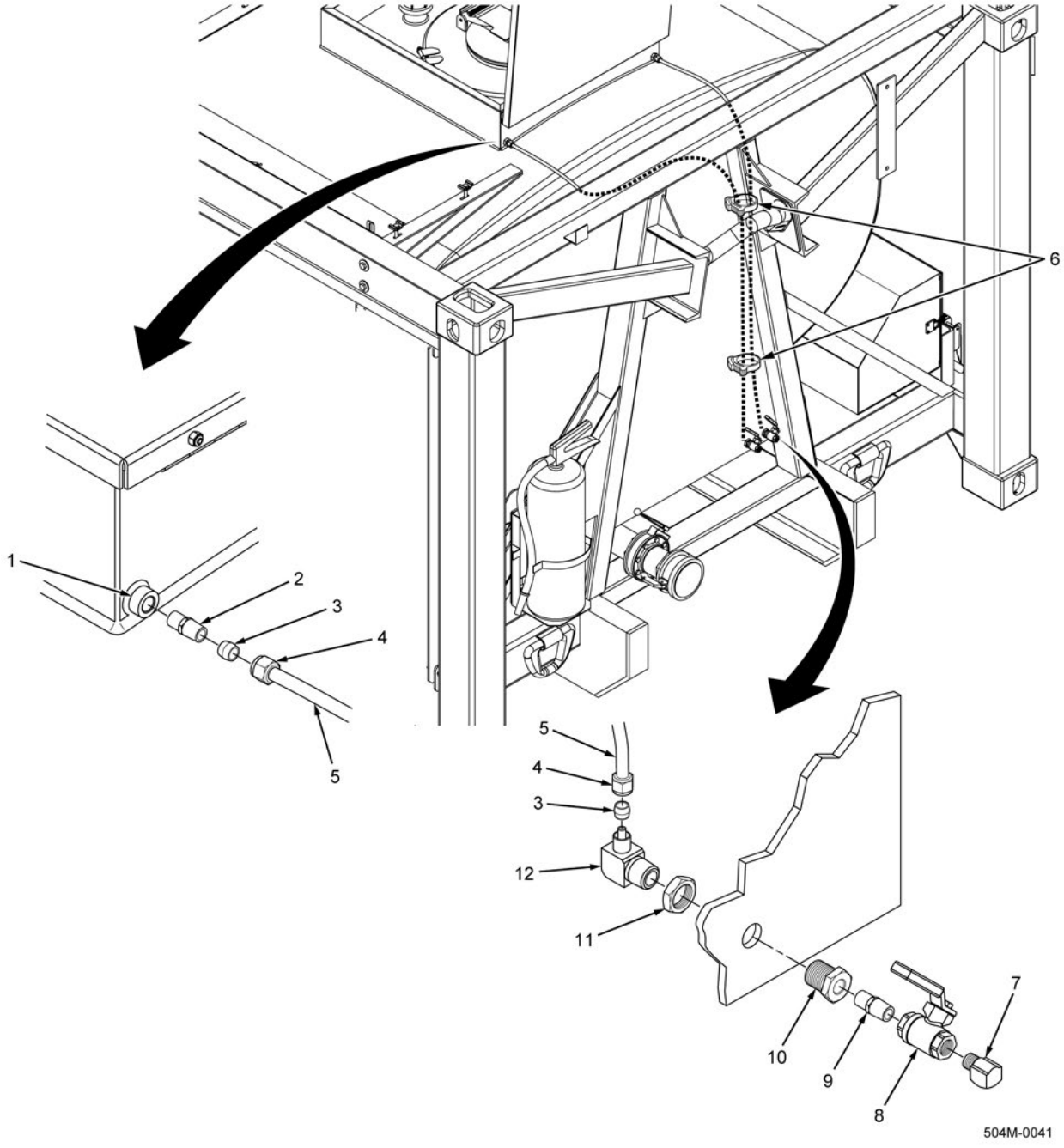


Figure 1. Spillbox Drain Lines.

INSTALLATION - Continued

1. Install bulkhead fitting (Figure 1, Item 10), then install nut (Figure 1, Item 11) on bulkhead fitting (Figure 1, Item 10).

WARNING

Thread sealing compound is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Failure to comply may cause injury to personnel.

2. Apply thread sealing compound to elbow (Figure 1, Item 12), nipple (Figure 1, Item 9), elbow (Figure 1, Item 7), and coupling side of fitting (Figure 1, Item 2) except for tube nut threads.
3. Install nipple (Figure 1, Item 9) on bulkhead fitting (Figure 1, Item 10).
4. Install valve (Figure 1, Item 8) on nipple (Figure 1, Item 9).
5. Install elbow (Figure 1, Item 7) on valve (Figure 1, Item 8).
6. Install elbow (Figure 1, Item 12) on bulkhead fitting (Figure 1, Item 10).
7. Install fitting (Figure 1, Item 2) and coupling (Figure 1, Item 1) on spillbox.
8. If necessary, install new tube nuts (Figure 1, Item 4) and ferrules (Figure 1, Item 3) on drain line (Figure 1, Item 5).
9. Install drain line (Figure 1, Item 5). Tighten tube nuts (Figure 1, Item 4).
10. Install two snap grip clips (Figure 1, Item 6) on drain line (Figure 1, Item 5).

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
VENT VALVE ASSEMBLY REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposable nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)
- Pan, drip (WP 0217, Table 1, Item 8)

Materials/Parts
- Absorbent material (WP 0216, Table 1, Item 1)
- Cloth, cleaning (WP 0216, Table 1, Item 4)
- Sealing compound (WP 0216, Table 1, Item 13)
- Gasket (WP 0200, Figure 54, Item 2)
- Gasket (WP 0154, Figure 8, Item 6)
- Nut, self-locking, hexagon (LOCKNUTS) Qty: 2 (WP 0200, Figure 54, Item 5)
- Vent Valve Assembly (WP 0154, Figure 8, Item 3)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer (2)

References
- ATP 4-43
- WP 0049

Equipment Condition
- MFS TRM grounded (TM 10-4930-371-10)
- MFS TRM drained (TM 10-4930-371-10)
- Handrail and handhold raised (TM 10-4930-371-10)

Time to Complete
- 1 Hour(s)

REMOVAL

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Climbing on top of the MFS TRM presents a fall hazard. Use handrail assembly and handholds at all times and always use “three point contact” with the MFS TRM when climbing on top of the tank to avoid falls. “Three point contact” means that one hand and two feet, or two hands and one foot are in contact with the MFS TRM at all times when climbing on top of the tank. Failure to comply could result in injury or death to personnel.
- Failure to comply could result in injury or death to personnel.

CAUTION

Do not allow residual cork gasket material or other debris to fall into tank. Contaminated fuel can cause equipment damage.

1. Remove vapor recovery line dust cap (Figure 1, Item 2).
2. Momentarily open then close (V1) bottom loading valve (Figure 1, Item 1) to vent tank pressure.

REMOVAL - Continued

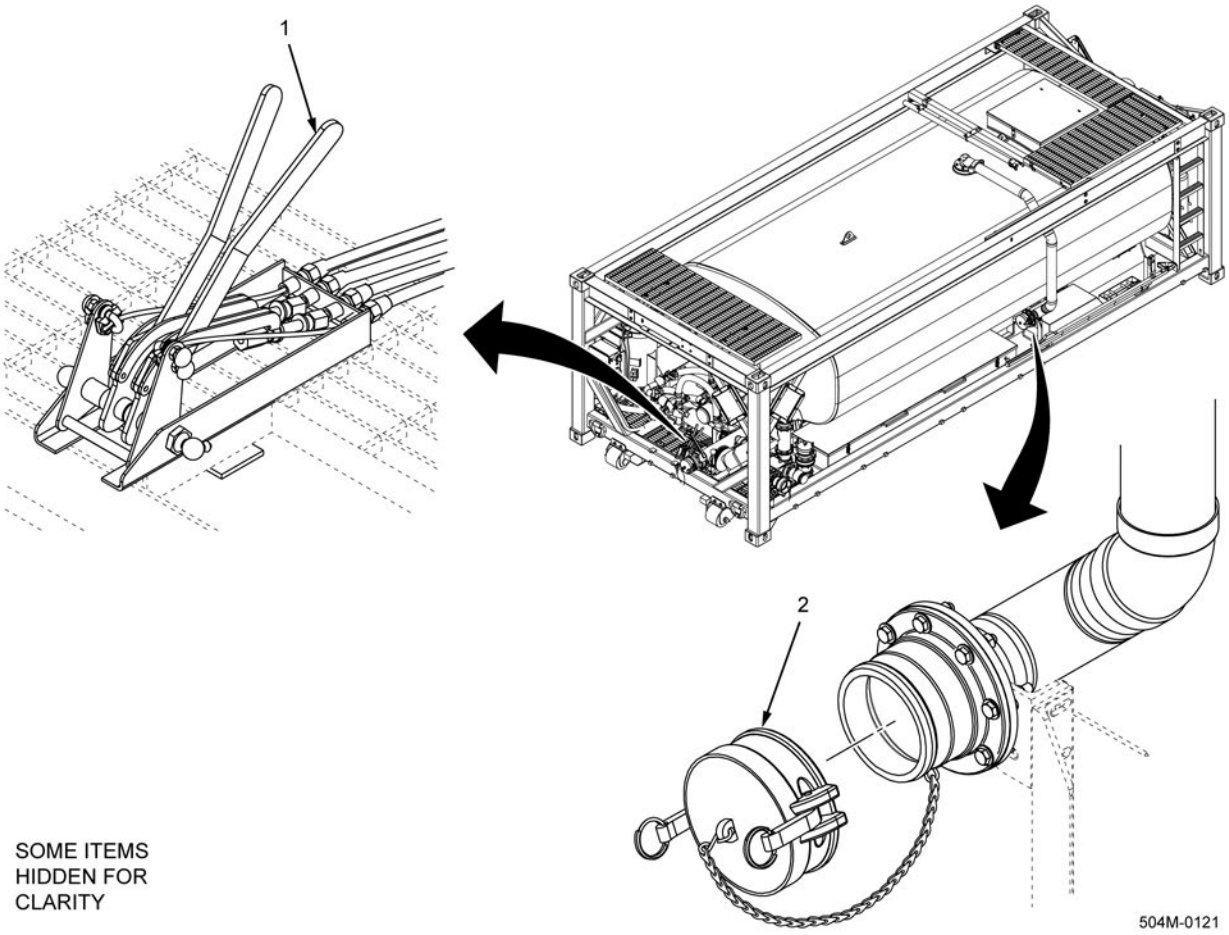


Figure 1. Fuel System Venting.

3. Remove two nuts (Figure 2, Item 1), bolts (Figure 2, Item 3) and coupling halves (Figure 2, Item 2).
4. Slide coupling gasket (Figure 3, Item 9) onto vapor recovery line (Figure 3, Item 8).

REMOVAL - Continued

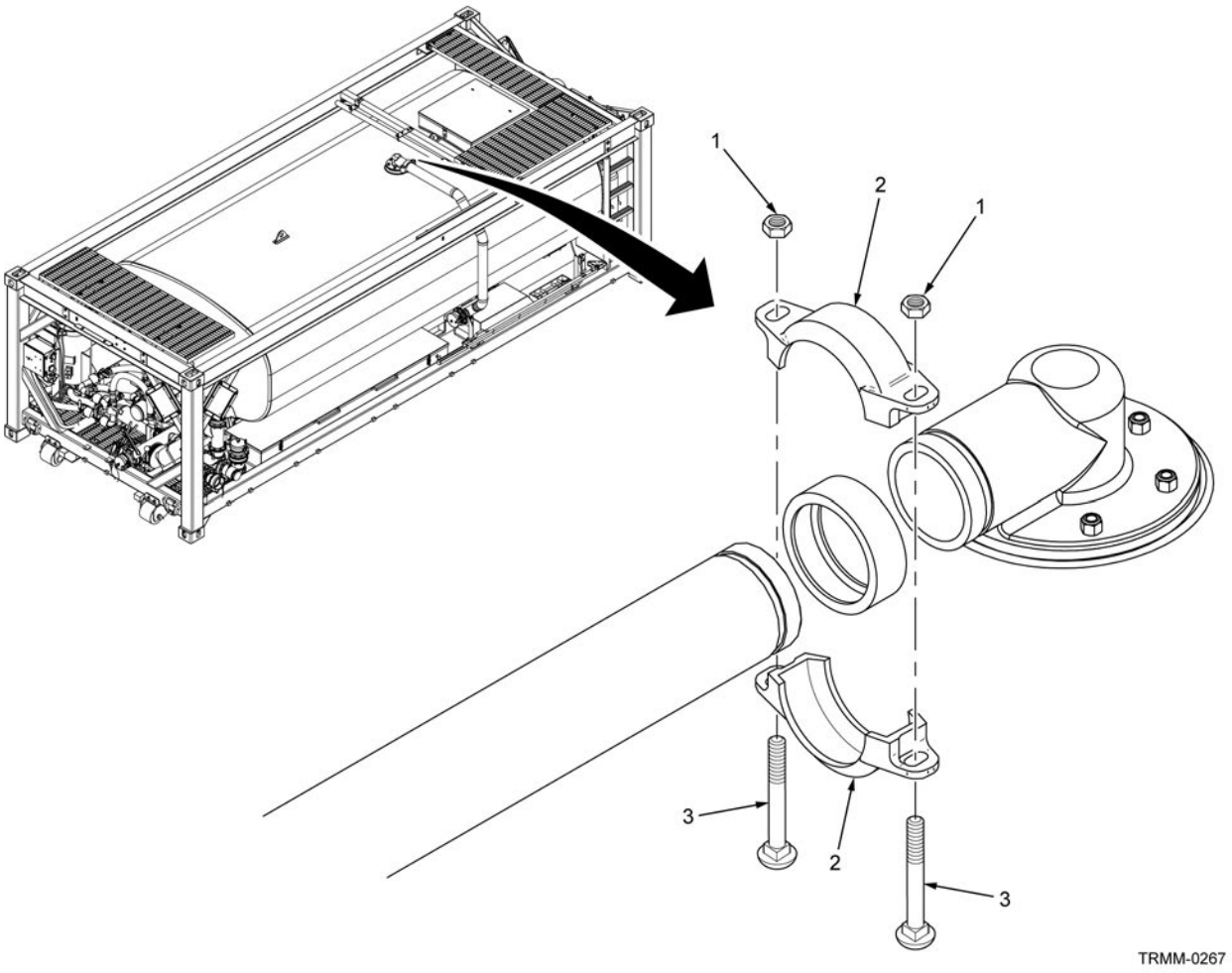


Figure 2. Removing Coupling.

5. Push vapor recovery line (Figure 3, Item 8) aside, and remove hex nut (Figure 3, Item 1) from inside vent valve assembly (Figure 3, Item 3).
6. Remove remaining five hex nuts (Figure 3, Item 2).
7. Lift vent valve assembly (Figure 3, Item 3) off studs (Figure 3, Item 5).

NOTE

Ensure guide tube is attached to valve assembly. If guide tube is not attached to valve assembly, it is in the actuator rod or bottom of the tank. Remove the bottom loading valve (WP 0049) and retrieve guide tube.

8. Remove coupling gasket (Figure 3, Item 9) from vapor recovery line (Figure 3, Item 8). Discard coupling gasket.
9. Remove and discard cork gasket (Figure 3, Item 4).

REMOVAL - Continued

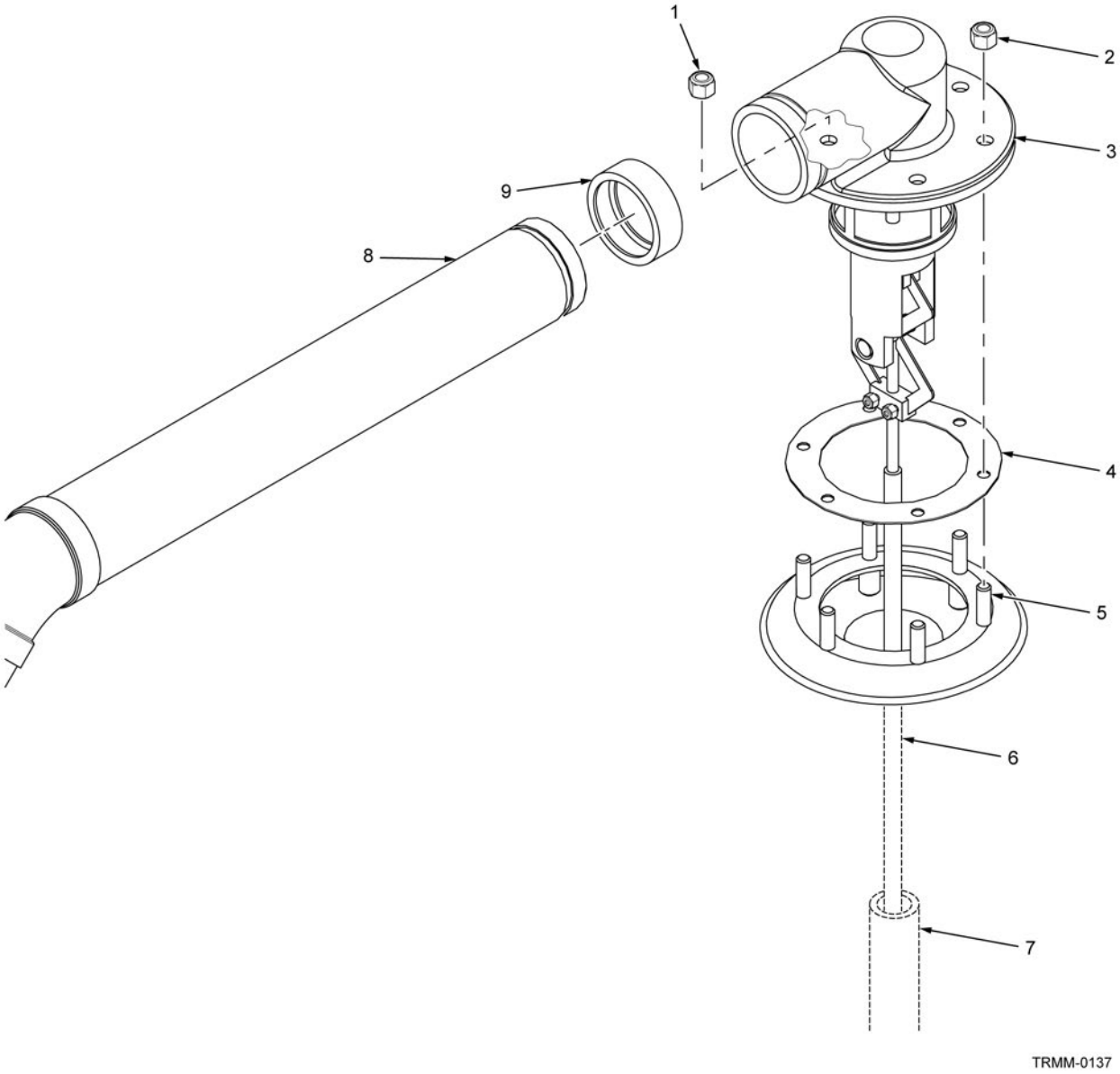


Figure 3. Vent Valve Removal.

CAUTION

Do not allow residual cork gasket material or other debris to fall into tank. Contaminated fuel can cause equipment damage.

10. Scrape residual gasket material from mating surfaces components.

END OF TASK

CLEANING

WARNING

Solvent cleaning compound MIL-PRF-680 Type III is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Keep away from open flames and other sources of ignition. Failure to comply may cause injury to personnel.

1. Remove all buildup of dirt, oil, and debris from all mating surfaces and clamping areas.
2. Clean all metal parts with a cleaning cloth and solvent cleaning compound.
3. Allow parts to dry thoroughly.

END OF TASK

INSTALLATION

1. Lightly lubricate new coupling gasket (Figure 3, Item 9) with fuel and install on vapor recovery line (Figure 3, Item 8).
2. Install new cork gasket (Figure 3, Item 4).
3. Position new vent valve assembly (Figure 3, Item 3) over tank opening and insert guide tube (Figure 3, Item 6) into actuating rod (Figure 3, Item 7) while lowering vent valve assembly (Figure 3, Item 3) into place.
4. Lower vent valve assembly (Figure 3, Item 3) onto studs (Figure 3, Item 5).
5. Install nut (Figure 3, Item 1) inside vent valve assembly (Figure 3, Item 3).
6. Secure vent valve assembly (Figure 3, Item 3) in place with remaining five hex nuts (Figure 3, Item 2).
7. Mate vent valve assembly (Figure 3, Item 3) with vapor recovery line (Figure 3, Item 8) and slide coupling gasket (Figure 3, Item 9) into place between vapor recovery line (Figure 3, Item 8) and vent valve assembly (Figure 3, Item 3).
8. Remove two bolts (Figure 4, Item 6), four flat washers (Figure 4, Item 4), and two locknuts (Figure 4, Item 3) from bracket (Figure 4, Item 5). Discard locknuts.
9. Align vapor recovery line (Figure 4, Item 1) and vent valve assembly (Figure 4, Item 2).

INSTALLATION - Continued

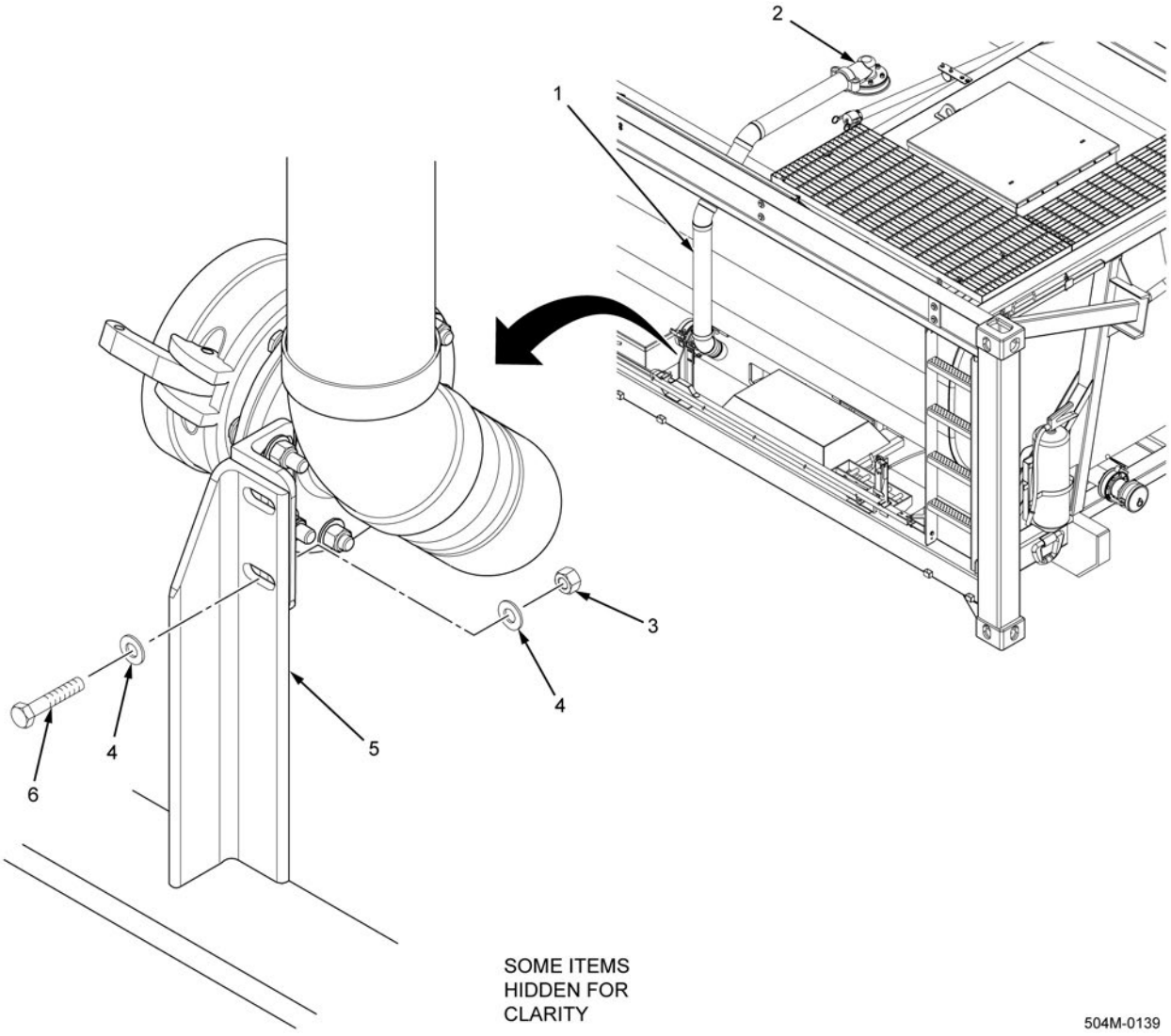


Figure 4. Vapor Recovery Line Installation.

10. Ensure coupling gasket (Figure 5, Item 3) is in place, install coupling halves (Figure 5, Item 2), and secure with two bolts (Figure 5, Item 4) and two nuts (Figure 5, Item 1) until coupling halves are contacting each other on each side.

INSTALLATION - Continued

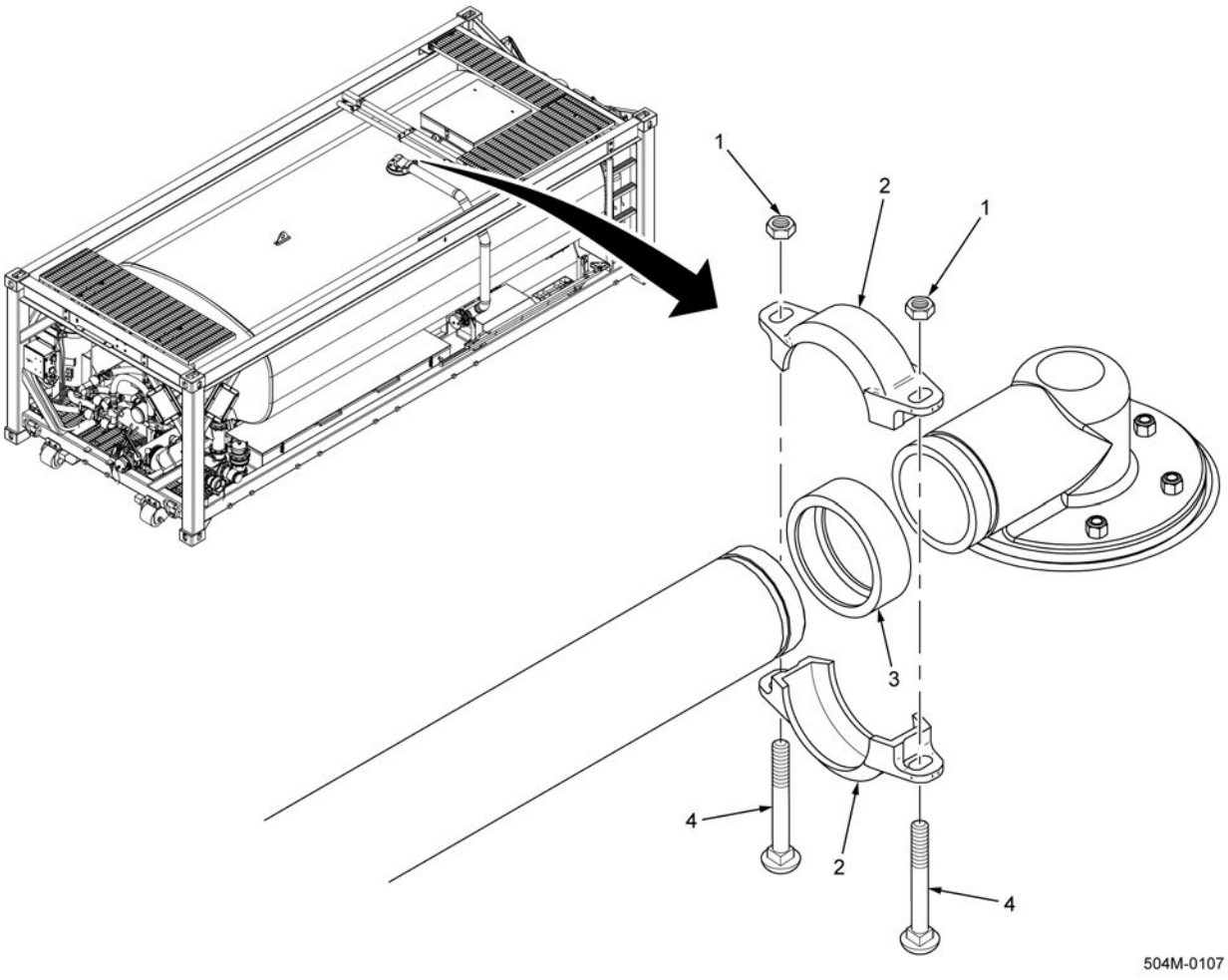


Figure 5. Installing Coupling.

11. Install two bolts (Figure 6, Item 6), four washers (Figure 6, Item 4), and two new locknuts (Figure 6, Item 3) on bracket (Figure 6, Item 5).

INSTALLATION - Continued

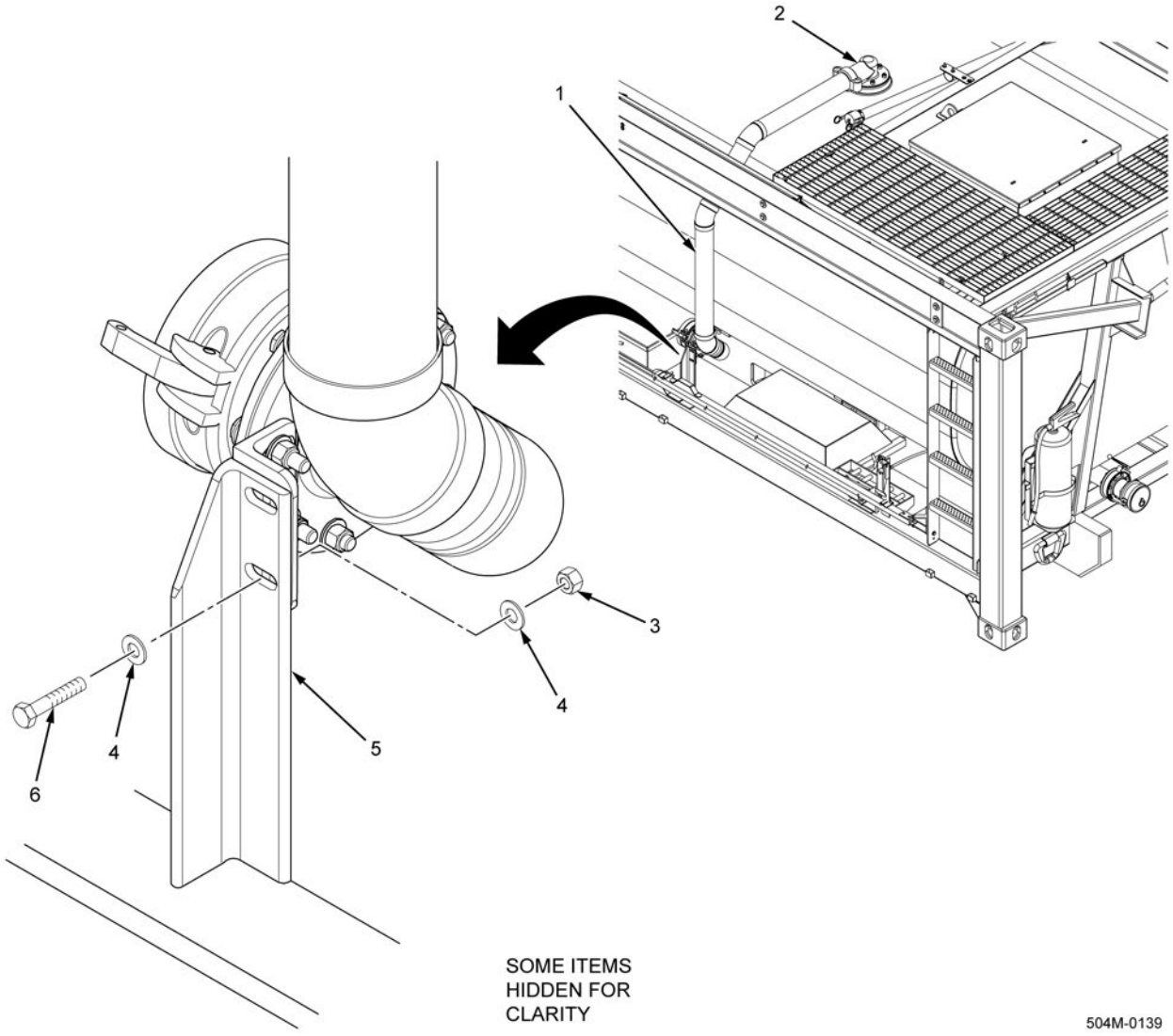


Figure 6. Installing Vapor Recovery Line.

INSTALLATION - Continued

12. Install vapor recovery line dust cap (Figure 7, Item 1).

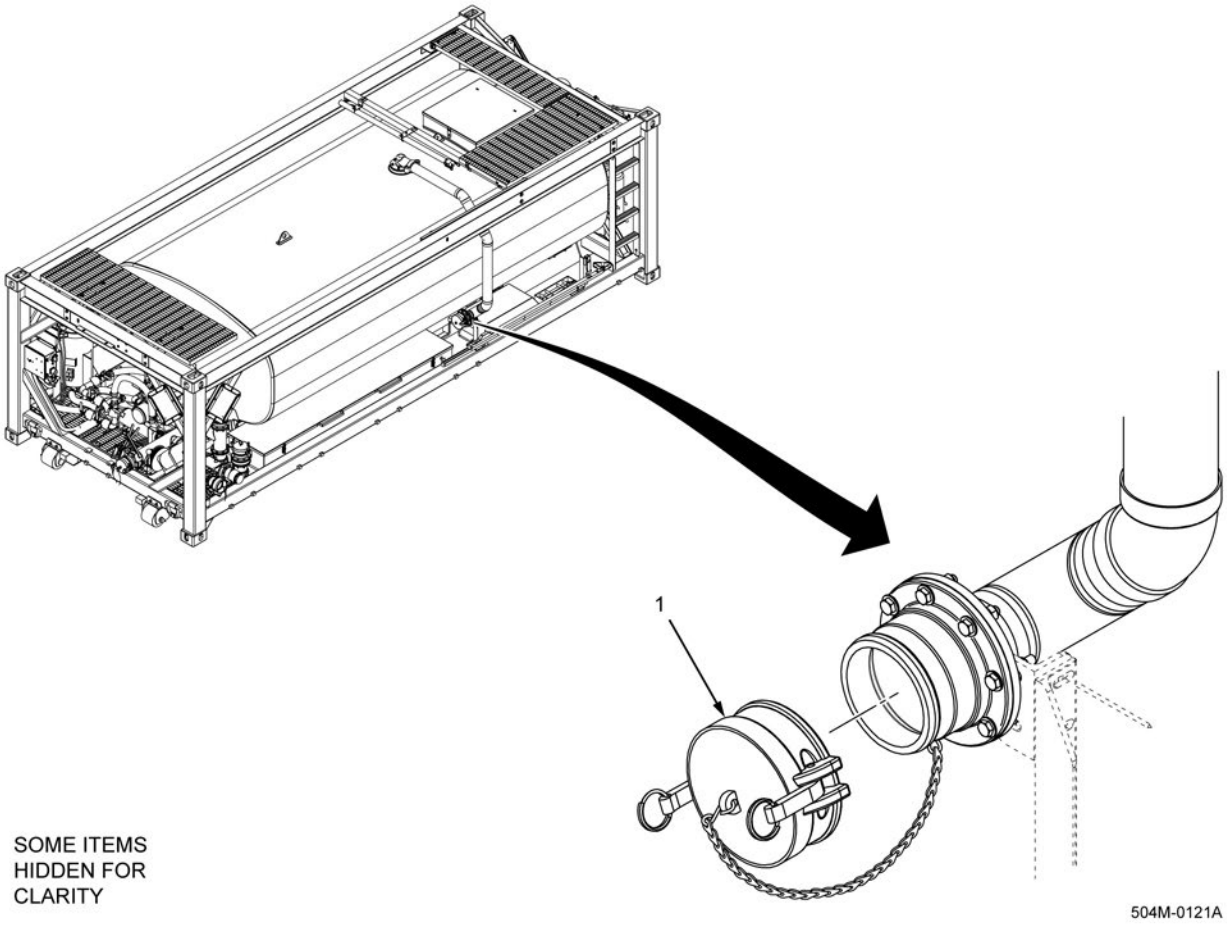


Figure 7. Installing Vapor Recovery Line Dust Cap.

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
PORT F (V17) DRY BREAK COUPLING REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposable nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)
- Wrench, adjustable, automotive (WP 0217, Table 1, Item 17)

Materials/Parts
- Absorbent material (WP 0216, Table 1, Item 1)
- Cleaning compound, solvent (WP 0216, Table 1, Item 3)
- Thread sealing compound (WP 0216, Table 1, Item 15)
- Port F (V17) Dry Break Coupling (WP 0155, Figure 9, Item 1)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer

References
- ATP 4-43

Equipment Condition
- MFS TRM grounded (TM 10-4930-371-10)
- MFS TRM shut down (TM 10-4930-371-10)
- MFS TRM handhold raised (TM 10-4930-371-10)
- MFS TRM handrail raised (TM 10-4930-371-10)

Time to Complete
- 1.0 Hour(s)

REMOVAL

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Use a drip pan to collect leaking fuel. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the Modular Fuel System Tank Rack Module (MFS TRM) prior to the transfer of fuel.
- Follow all fuel operations IAW ATP 4-43. Ensure grounding and bonding connections are made properly before any fueling operations. Stop fueling operations immediately at the first sign of a leak or malfunction.
- Wet metal surfaces are slippery. Use caution when climbing on top of MFS TRM.
- Ground self and equipment before any fueling operations to prevent explosion caused by electrostatic charge.
- Climbing on top of the MFS TRM presents a fall hazard. Use handrail assembly and handholds at all times and always use “three point contact” with the MFS TRM when climbing on top of the tank to avoid falls. “Three point contact” means that one hand and two feet, or two hands and one foot are in contact with the MFS TRM at all times when climbing on top of the tank. Failure to comply could result in injury or death to personnel.
- Failure to comply could result in injury or death to personnel.

1. Remove vapor recovery line dust cap (Figure 1, Item 2).
2. Momentarily open then close bottom loading valve (V1) (Figure 1, Item 1) to vent tank pressure.

REMOVAL - Continued

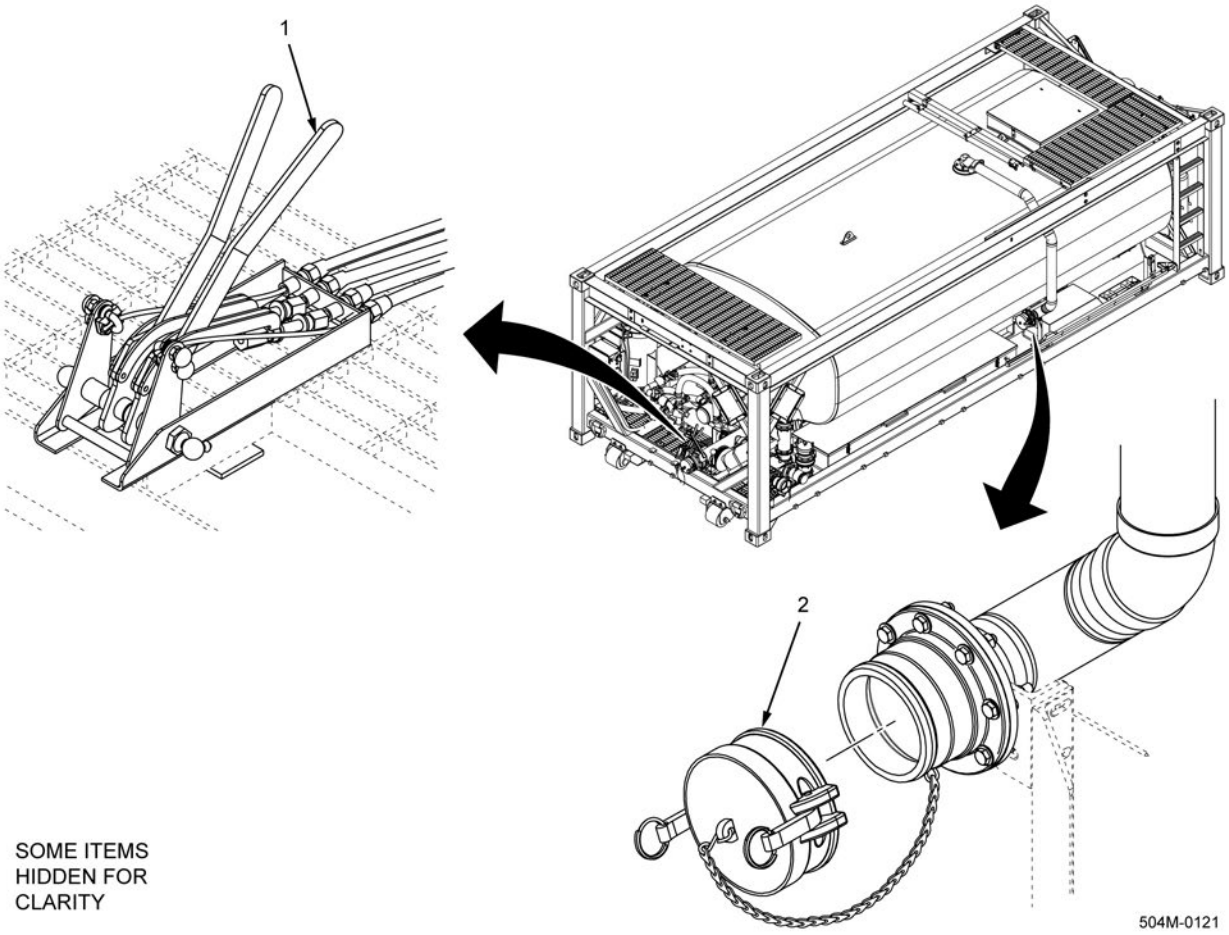


Figure 1. Fuel System Venting.

3. Open spillbox lid (Figure 2, Item 2).
4. Open manhole cover (Figure 2, Item 1) to relieve pressure.
5. Unscrew coupling (Figure 3, Item 2) from tank fitting (Figure 3, Item 1).

REMOVAL - Continued

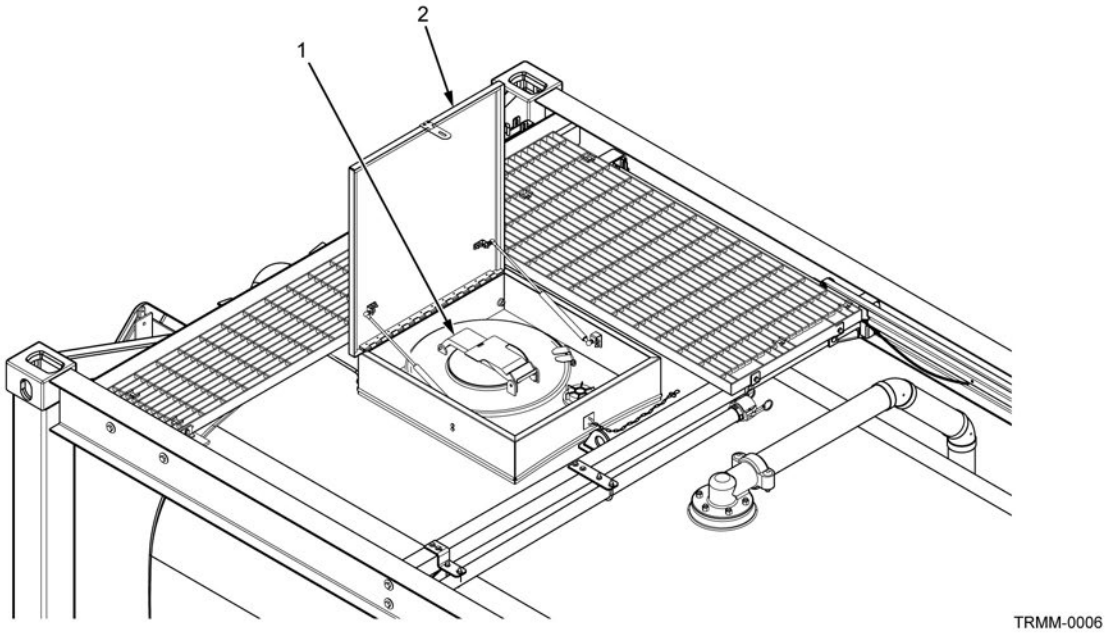


Figure 2. Opening Manhole Cover and Spillbox Lid.

END OF TASK

CLEANING

WARNING

Solvent cleaning compound MIL-PRF-680 Type III is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Keep away from open flames and other sources of ignition. Failure to comply may cause injury to personnel.

1. Clean threads of all disassembled components. Remove all buildup of dirt, oil, and debris from threads.
2. Clean all metal parts with a cleaning cloth and solvent cleaning compound.
3. Allow parts to dry thoroughly.

END OF TASK

INSTALLATION

WARNING

Thread sealing compound is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Failure to comply may cause injury to personnel.

1. Apply thread sealing compound to threads on coupling (Figure 3, Item 2).
2. Screw coupling (Figure 3, Item 2) onto tank fitting (Figure 3, Item 1) until hand tight, then tighten three full turns.

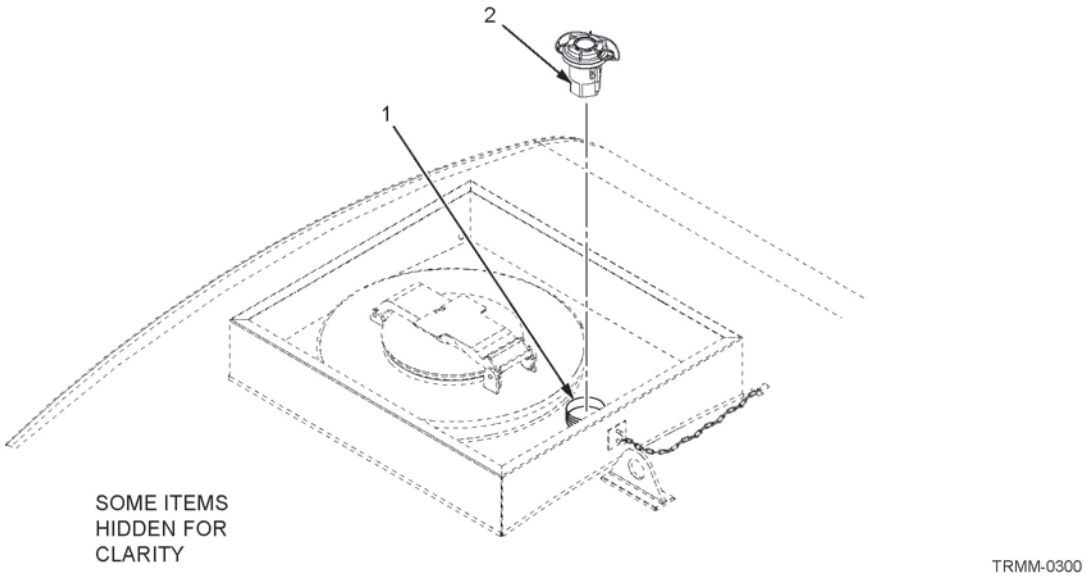


Figure 3. (V17) Dry Break Coupling (Port F).

INSTALLATION - Continued

3. Close manhole cover (Figure 4, Item 1).
4. Close spillbox lid (Figure 4, Item 2).

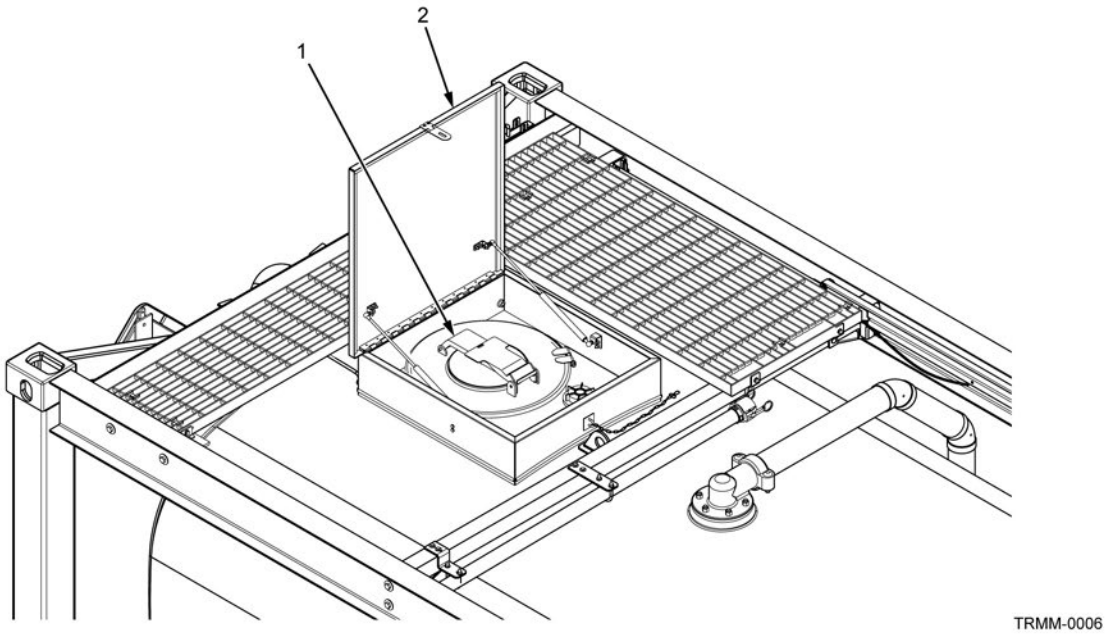


Figure 4. Closing Manhole Cover and Spillbox Lid.

5. Install vapor recovery line dust cap (Figure 5, Item 1).

INSTALLATION - Continued

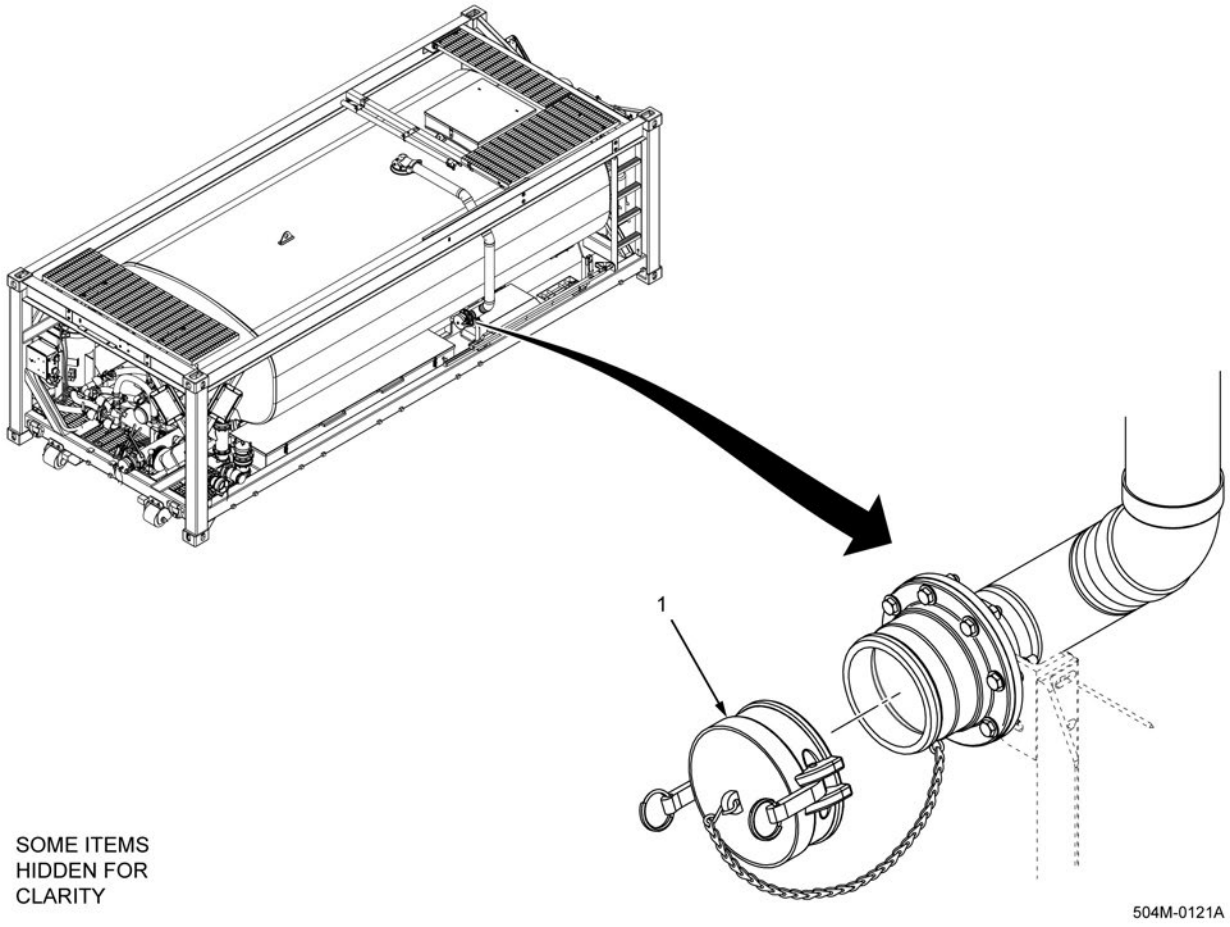


Figure 5. Installing Vapor Recovery Line Dust Cap.

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
PORT F (V17) DRY BREAK COUPLING REPAIR

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposable nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)
- Vise, machinist's (WP 0217, Table 1, Item 14)

Materials/Parts
- Absorbent material (WP 0216, Table 1, Item 1)
- Cleaning compound, solvent (WP 0216, Table 1, Item 3)
- Cloth, cleaning (WP 0216, Table 1, Item 4)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer

References
- WP 0059

Equipment Condition
- MFS TRM shut down (TM 10-4930-371-10)
- MFS TRM grounded (TM 10-4930-371-10)
- Port F (V17) drybreak coupling removed (WP 0059)

Time to Complete
- 1 Hour(s)

DISASSEMBLY

1. Place port F (V17) dry break coupling (Figure 1, Item 5) in vise.
2. Remove dust cap (Figure 1, Item 2) from port F (V17) dry break coupling (Figure 1, Item 5).
3. Remove seal (Figure 1, Item 3) from dust cap (Figure 1, Item 2). Discard dust cap seal.
4. Remove cap (Figure 1, Item 2) lanyard (Figure 1, Item 1), and split ring (Figure 1, Item 6) from coupling (Figure 1, Item 5).

DISASSEMBLY - Continued

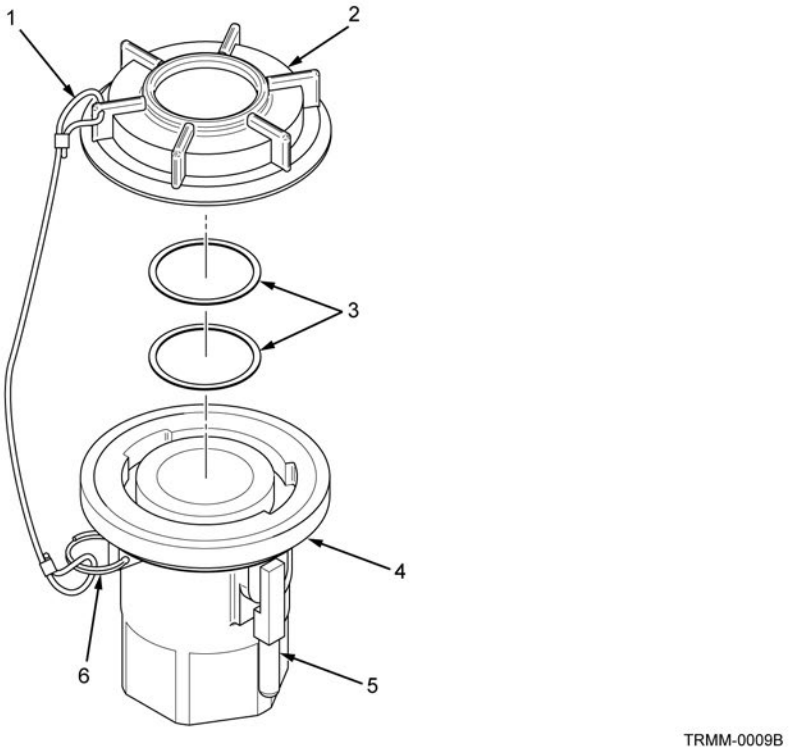


Figure 1. Disassembling Port F (V17) Dry Break Coupling.

5. Remove bumper (Figure 1, Item 4) from port F (V17) dry break coupling (Figure 1, Item 5). Discard bumper.
6. Remove seal (Figure 1, Item 3) from port F (V17) dry break coupling (Figure 1, Item 5). Discard seal.

END OF TASK

CLEANING

WARNING

Solvent cleaning compound MIL-PRF-680 Type III is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Keep away from open flames and other sources of ignition. Failure to comply may cause injury to personnel.

1. Clean any residual thread sealant from threads of all components.
2. Clean all metal parts with a cleaning cloth and solvent cleaning compound.

CLEANING - Continued

3. Allow parts to dry thoroughly.

END OF TASK

ASSEMBLY

1. Install new seal (Figure 1, Item 3) in groove of port F (V17) dry break coupling (Figure 1, Item 5).
2. Install new bumper (Figure 1, Item 4) on port F (V17) dry break coupling (Figure 1, Item 5) with thin lip seal end facing away from port F (V17) dry break coupling (Figure 1, Item 5).
3. Install cap (Figure 1, Item 2) lanyard (Figure 1, Item 1), and split ring (Figure 1, Item 6) on port F (V17) dry break coupling (Figure 1, Item 5).
4. Install new seal (Figure 1, Item 3) on dust cap (Figure 1, Item 2).
5. Install dust cap (Figure 1, Item 2) on port F (V17) dry break coupling (Figure 1, Item 5).

END OF TASK

FOLLOW-ON MAINTENANCE

Install port F (V17) dry break coupling (WP 0059).

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
TANK GAUGE REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool kit, general mechanic's (WP 0217, Table 1, Item 13)

Materials/Parts
Tank gauge (WP 0156, Figure 10, Item 1)

Personnel Required
91J Quartermaster and Chemical Equipment Repairer

Equipment Condition
MFS TRM grounded (TM 10-4930-371-10)

Equipment Condition (cont.)
MFS TRM shut down (TM 10-4930-371-10)
MFS TRM set on level ground (TM 10-4930-371-10)

Time to Complete
0.4 Hour(s)

REMOVAL

NOTE

Note orientation of tank gauge prior to removal to aid in installation of new tank gauge.

1. Loosen set screw (Figure 1, Item 3).
2. Remove tank gauge (Figure 1, Item 1).
3. Remove grease fitting (Figure 1, Item 2).

END OF TASK

INSTALLATION

NOTE

Ensure tank gauge is installed relative to the fuel in tank.

1. Install grease fitting (Figure 1, Item 2).
2. Install new tank gauge (Figure 1, Item 1), ensuring it is oriented as noted during removal.
3. Tighten set screw (Figure 1, Item 3) to secure tank gauge (Figure 1, Item 1).

INSTALLATION - Continued

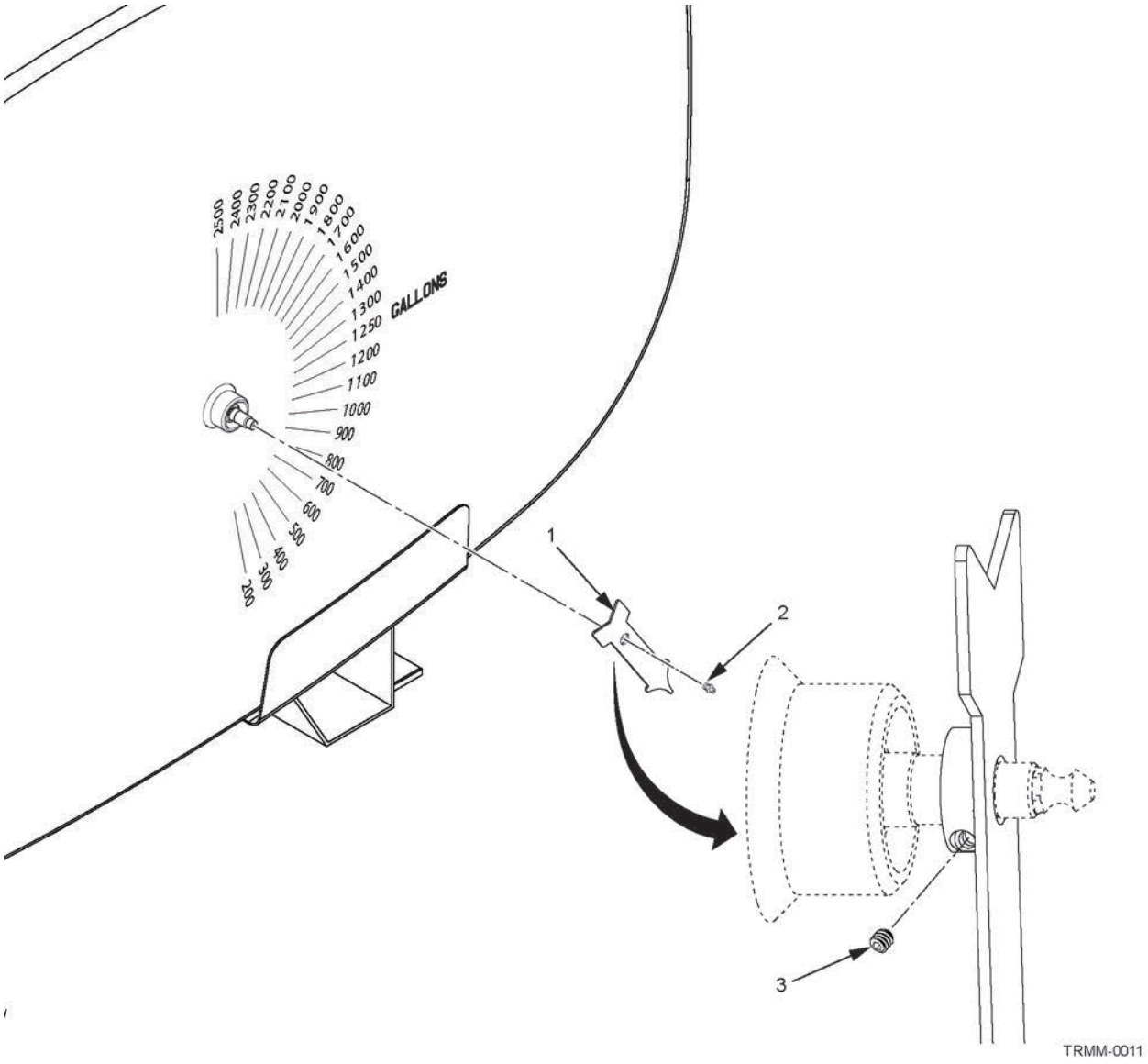


Figure 1. Tank Gauge Replacement.

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
GAUGE TUBE ASSEMBLY REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool kit, general mechanic's (WP 0217, Table 1, Item 13)

Materials/Parts
Nut, self-locking, hexagon (LOCKNUTS) Qty: 4 (WP 0157, Figure 11, Item 3)
Nut, self-locking, hexagon (LOCKNUTS) Qty: 4 (WP 0157, Figure 11, Item 13)
Gauge Tube Assembly (WP 0157, Figure 11, Item 1)

Personnel Required
91J Quartermaster and Chemical Equipment Repairer

Equipment Condition
MFS TRM grounded (TM 10-4930-371-10)

Equipment Condition (cont.)
MFS TRM shut down (TM 10-4930-371-10)
MFS TRM front handhold raised (TM 10-4930-371-10)

Time to Complete
1 Hour(s)

REMOVAL

1. Remove gauge stick (Figure 1, Item 3) as follows:
   a. Open cap (Figure 1, Item 2) on gauge tube (Figure 1, Item 1).
   b. Remove gauge stick (Figure 1, Item 3) from gauge tube (Figure 1, Item 1).

REMOVAL - Continued

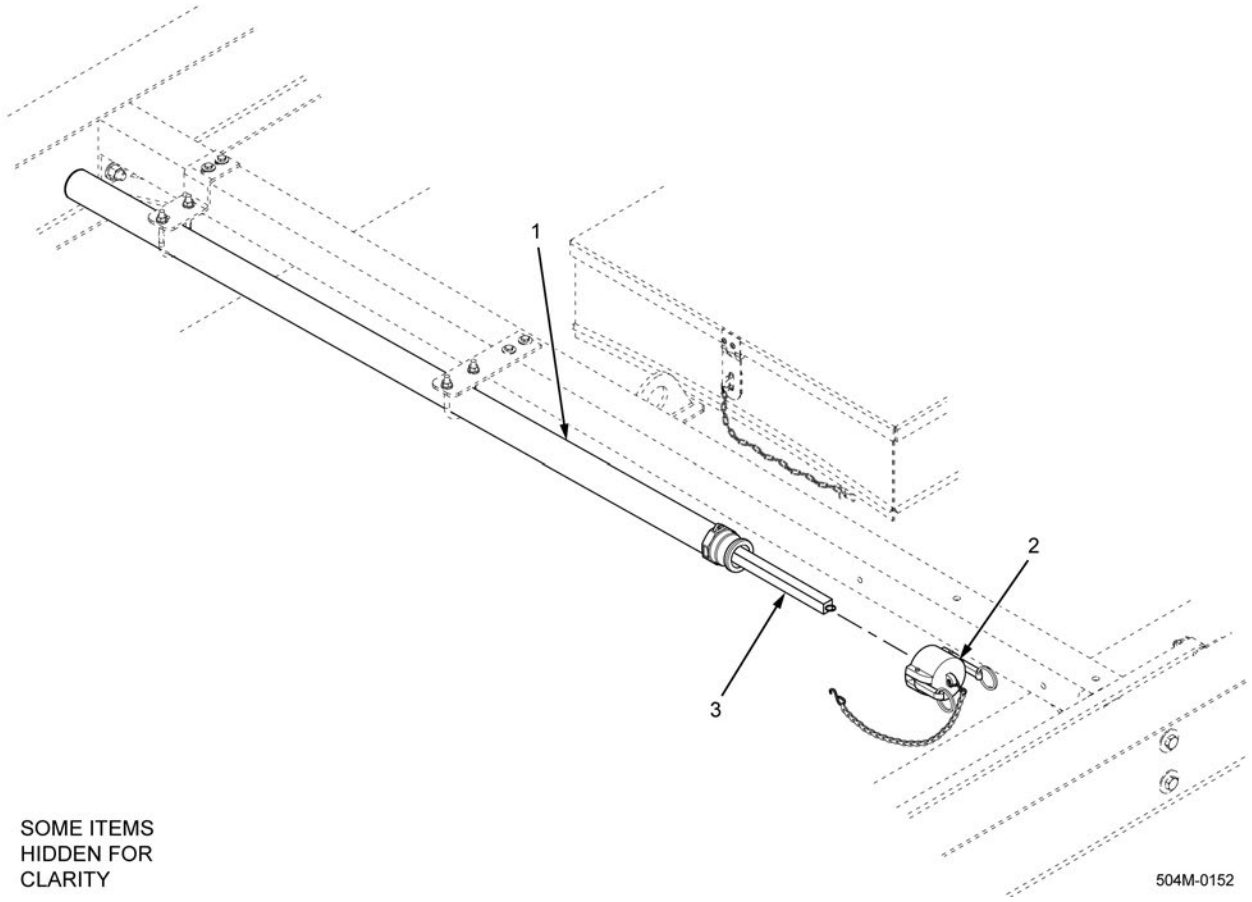


Figure 1. Gauge Stick Removal.

2. Remove four locknuts (Figure 2, Item 1), four flat washers (Figure 2, Item 2) and two U-bolts (Figure 2, Item 4) and remove gauge tube assembly (Figure 2, Item 5). Discard locknuts.

REMOVAL - Continued

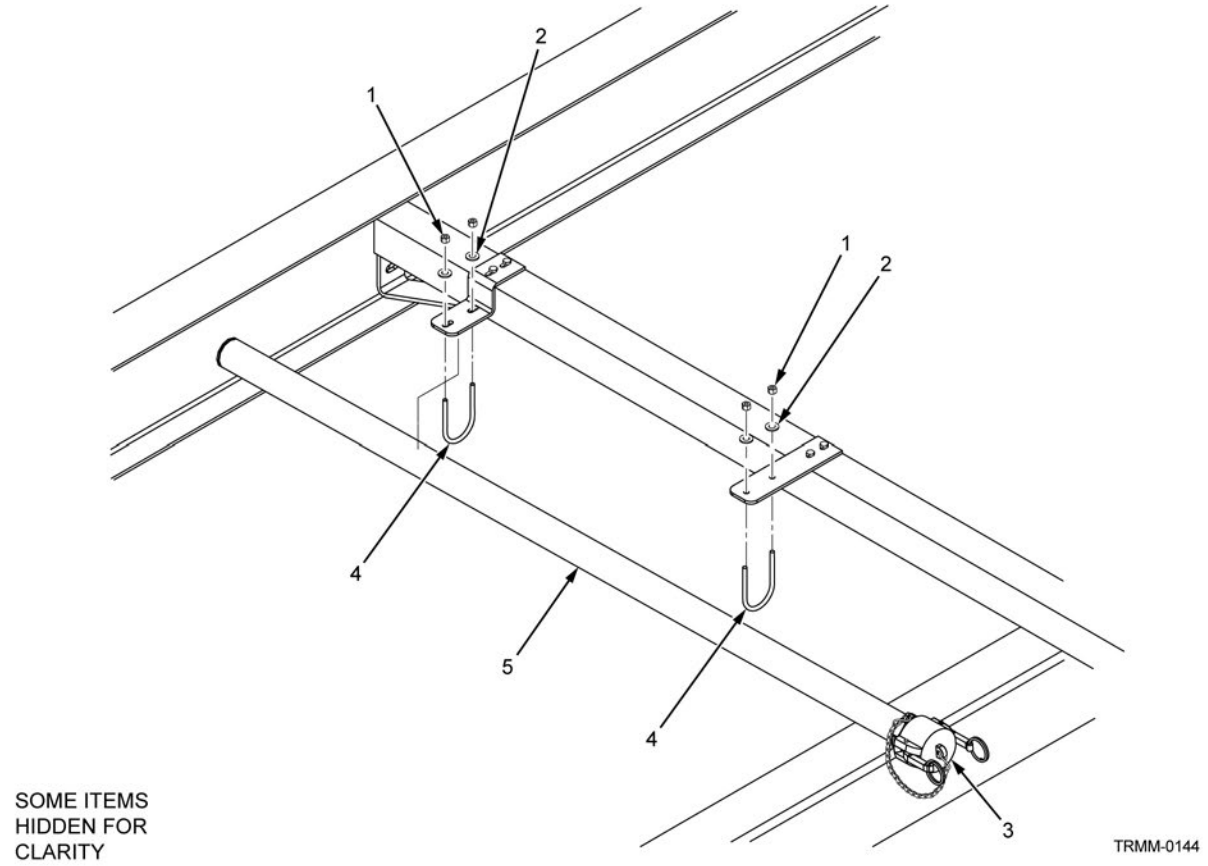


Figure 2. Gauge Tube Replacement.

3. If necessary, remove two locknuts (Figure 3, Item 4), four flat washers (Figure 3, Item 1), and two bolts (Figure 3, Item 2) and remove inboard gauge tube bracket (Figure 3, Item 5). Discard locknuts.
4. If necessary, remove two locknuts (Figure 3, Item 4), four flat washers (Figure 3, Item 1), and two bolts (Figure 3, Item 2) and remove outboard gauge tube bracket (Figure 3, Item 3) Discard locknuts.

END OF TASK

INSTALLATION

NOTE

There is a weep hole in the closed end of the gauge tube assembly. Gauge tube assembly must be installed with weep hole on the bottom to allow proper drainage.

1. If removed, install outboard gauge tube bracket (Figure 3, Item 3) and secure with two new locknuts (Figure 3, Item 4), four flat washers (Figure 3, Item 1), and two bolts (Figure 3, Item 2).
2. If removed, install inboard gauge tube bracket (Figure 3, Item 5) and secure with two new locknuts (Figure 3, Item 4), four flat washers (Figure 3, Item 1), and two bolts (Figure 3, Item 4).
3. Install gauge tube assembly (Figure 2, Item 5) and secure with four new locknuts (Figure 3, Item 1), four flat washers (Figure 3, Item 2) and two U-bolts (Figure 3, Item 3).

INSTALLATION - Continued

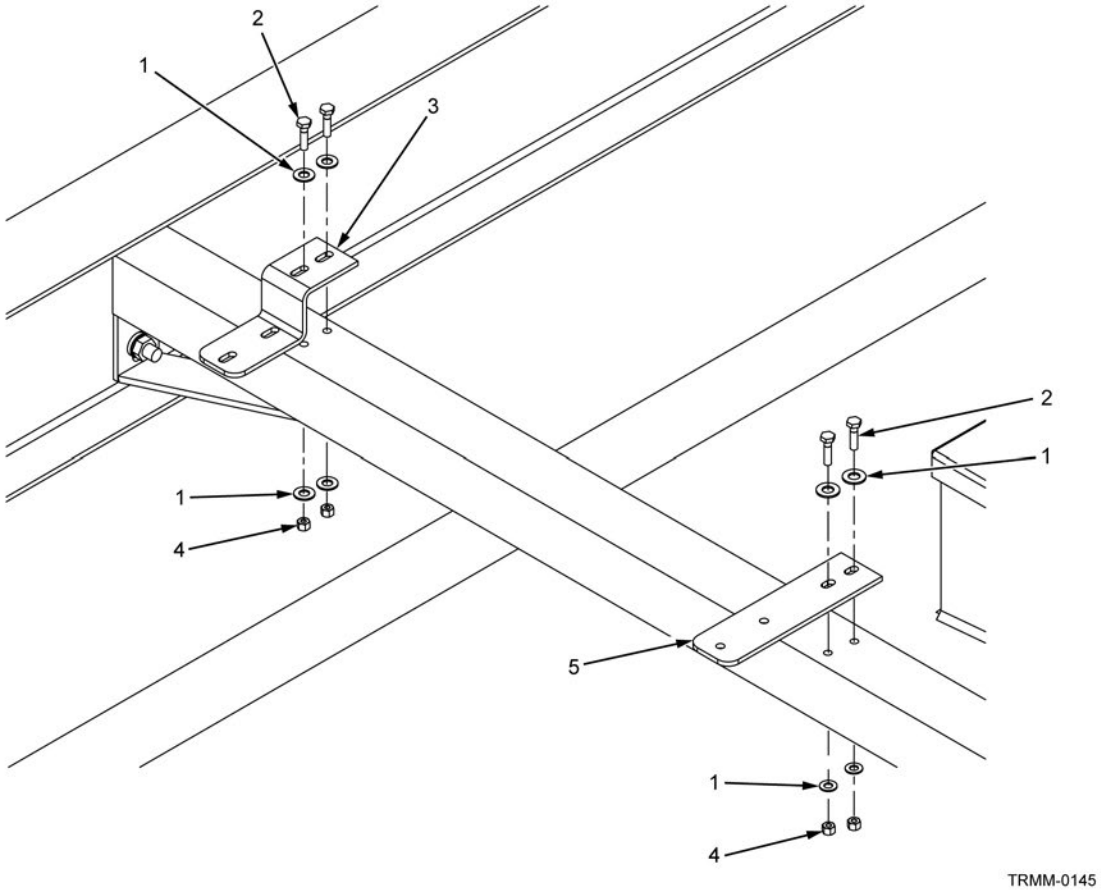


Figure 3. Gauge Tube Brackets Replacement.

4. Open cap (Figure 4, Item 2) on gauge tube (Figure 4, Item 1) and install gauge stick (Figure 4, Item 3).
5. Close cap (Figure 4, Item 2) on gauge tube (Figure 4, Item 1).

INSTALLATION - Continued

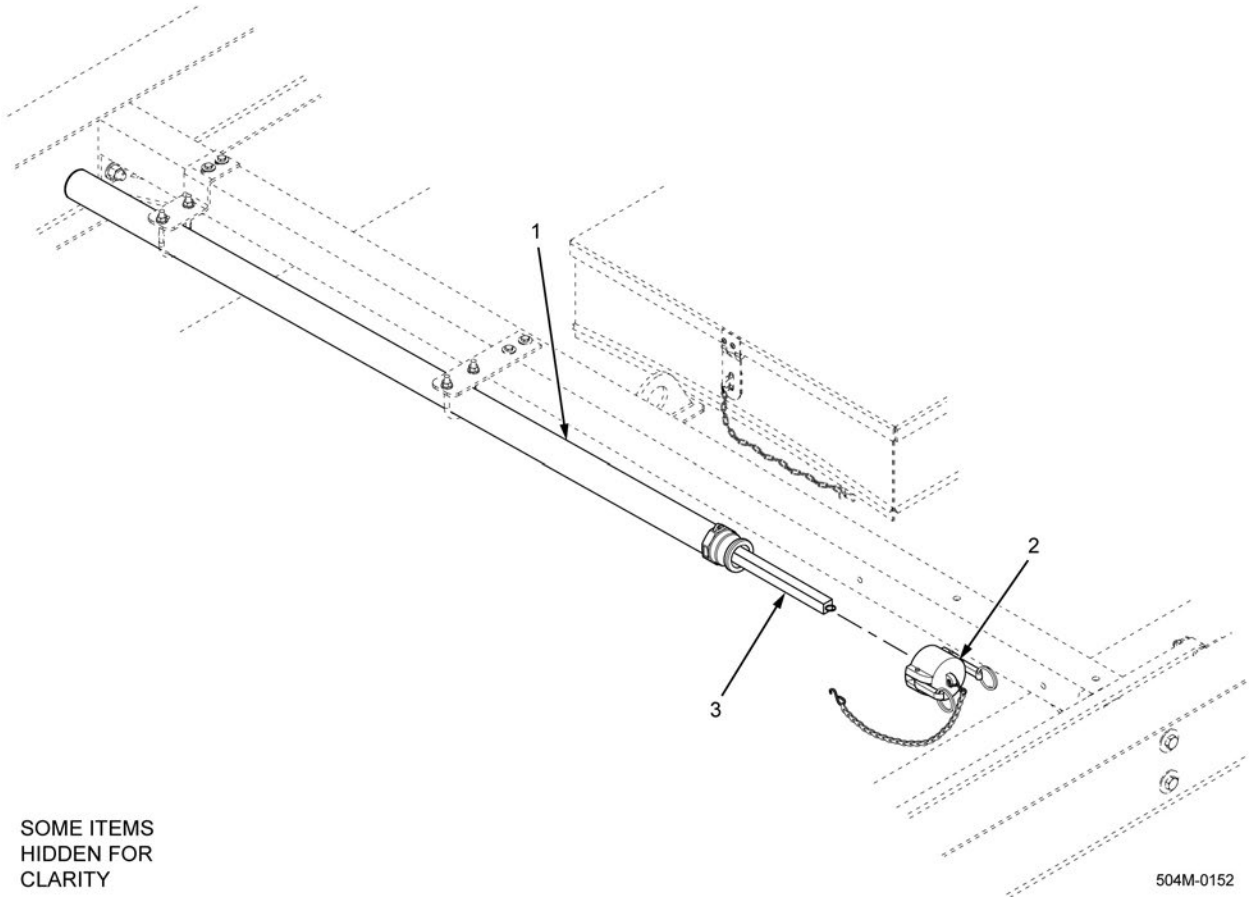


Figure 4. Gauge Stick Installation.

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
FRONT CATWALK ASSEMBLY REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool kit, general mechanic's (WP 0217, Table 1, Item 13)

Materials/Parts
Nut, self-locking, hexagon (LOCKNUTS) Qty: 9 (WP 0158, Figure 12, Item 6)
Nut, self-locking, hexagon (LOCKNUTS) Qty: 8 (WP 0158, Figure 12, Item 10)
Nut, self-locking, hexagon (LOCKNUTS) Qty: 6 (WP 0158, Figure 12, Item 14)
Front catwalk grate (WP 0158, Figure 12, Item 2)
Front forward grate (WP 0158, Figure 12, Item 19)

Personnel Required
91J Quartermaster and Chemical Equipment Repairer (2)

References
WP 0062
WP 0067

Equipment Condition
MFS TRM shut down (TM 10-4930-371-10)
MFS TRM grounded (TM 10-4930-371-10)
MFS TRM on ground (TM 10-4930-371-10)
Handrail removed (WP 0067)
Gauge tube removed (WP 0062)

Time to Complete
3.0 Hour(s)

REMOVAL

NOTE

Note orientation of hardware and components to aid in installation.

1. Remove three bolts (Figure 1, Item 4), six flat washers (Figure 1, Item 2), three spacers (Figure 1, Item 3), and three locknuts (Figure 1, Item 1). Discard locknuts.

REMOVAL - Continued

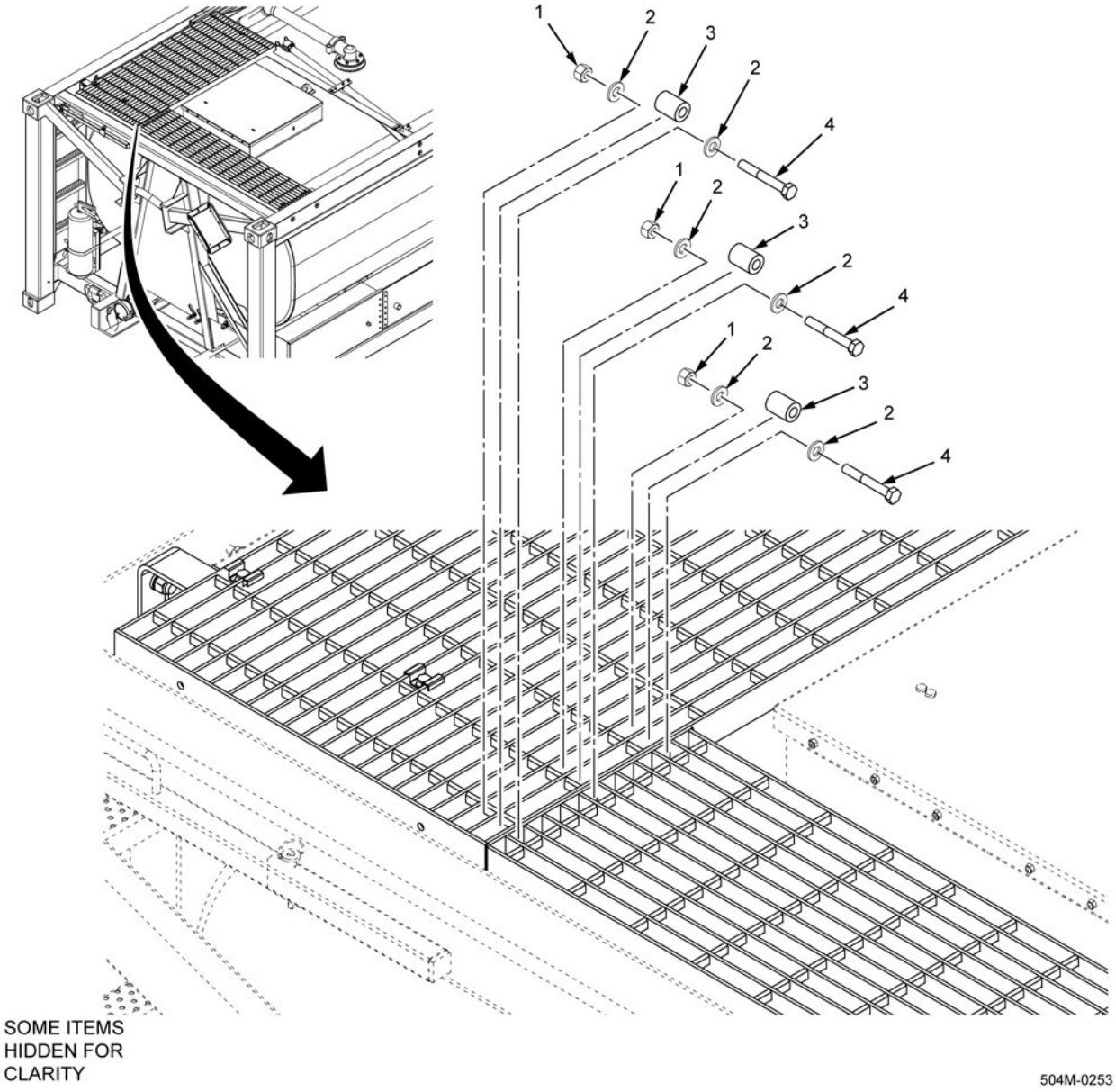


Figure 1. Front Catwalk Spacer Hardware.

2. Remove one bolt (Figure 2, Item 8), two flat washers (Figure 2, Item 9), and one locknut (Figure 2, Item 10) from catwalk lap bracket stop (Figure 2, Item 11). Discard locknut.
3. Remove one bolt (Figure 2, Item 5), flat washer (Figure 2, Item 6), and locknut (Figure 2, Item 7) from catwalk lap bracket stop (Figure 2, Item 11). Discard locknut.
4. Remove catwalk lap bracket stop (Figure 2, Item 11).
5. Remove two nuts (Figure 2, Item 4), two flat washers (Figure 2, Item 3), and two saddle clips (Figure 2, Item 2) from front catwalk forward grate (Figure 2, Item 1).
6. Remove front catwalk forward grate (Figure 2, Item 1).

REMOVAL - Continued

7. Remove two bolts (Figure 2, Item 12), four flat washers (Figure 2, Item 13), and two locknuts (Figure 2, Item 14) from front catwalk lap bracket (Figure 2, Item 15). Discard locknuts.
8. Remove front catwalk lap bracket (Figure 2, Item 15).

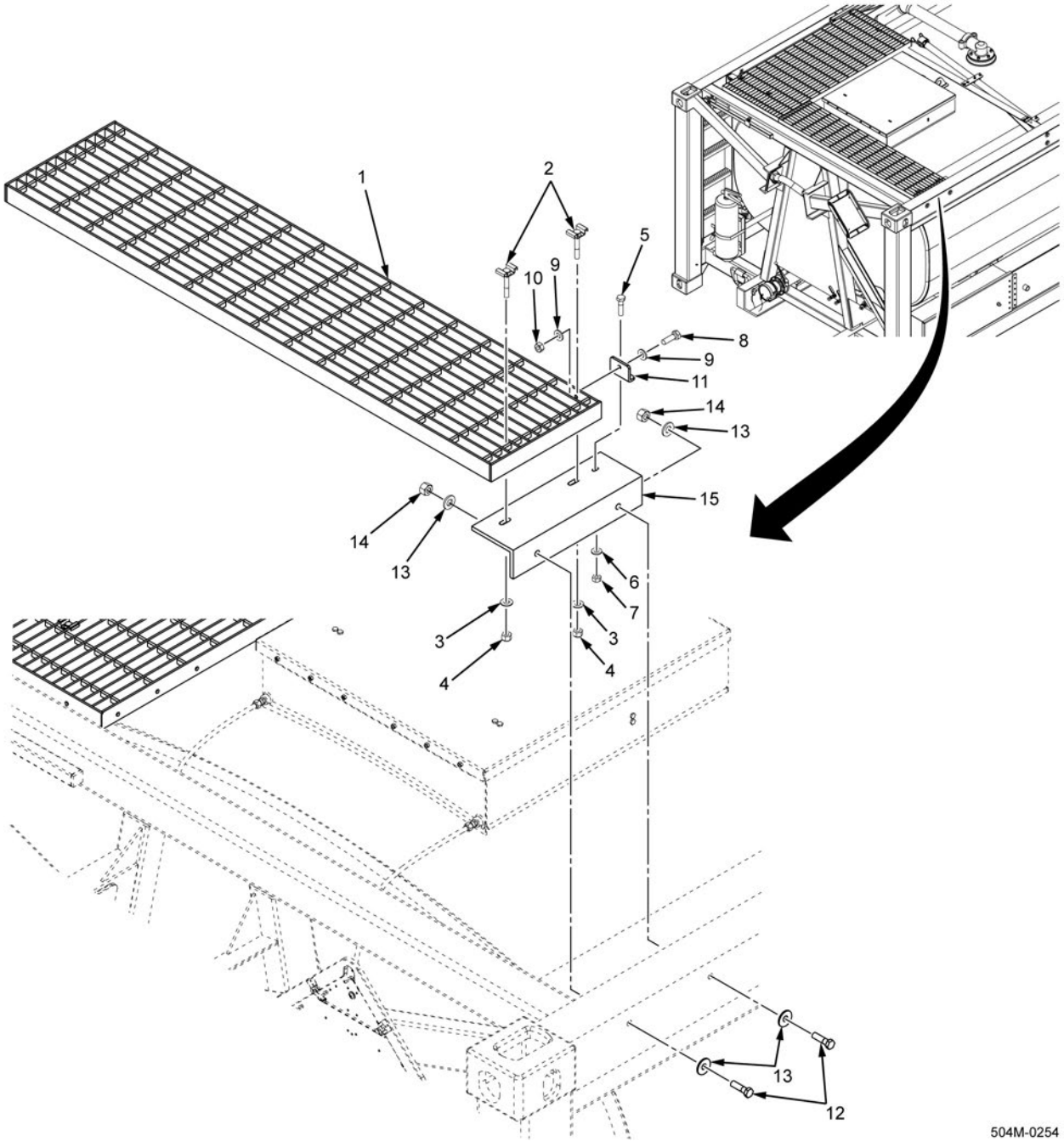


Figure 2. Front Catwalk Forward Grate.

REMOVAL - Continued

9. Remove four locknuts (Figure 3, Item 3), four flat washers (Figure 3, Item 2), and four saddle clips (Figure 3, Item 1). Discard locknuts.
10. Remove four bolts (Figure 3, Item 4), eight flat washers (Figure 3, Item 5), and four locknuts (Figure 3, Item 6) from catwalk Z brackets (Figure 3, Item 7). Discard locknuts.
11. Remove ladder-side front catwalk grate (Figure 3, Item 8).
12. Remove two bolts (Figure 3, Item 9), four flat washers (Figure 3, Item 10), two locknuts (Figure 3, Item 11), and one catwalk doubler (Figure 3, Item 12). Discard locknuts.
13. Remove catwalk ladder-side mount bracket (Figure 3, Item 13).
14. Remove four bolts (Figure 3, Item 14), eight flat washers (Figure 3, Item 15), and four locknuts (Figure 3, Item 16). Discard locknuts.
15. Remove front catwalk span (Figure 3, Item 17).

REMOVAL - Continued

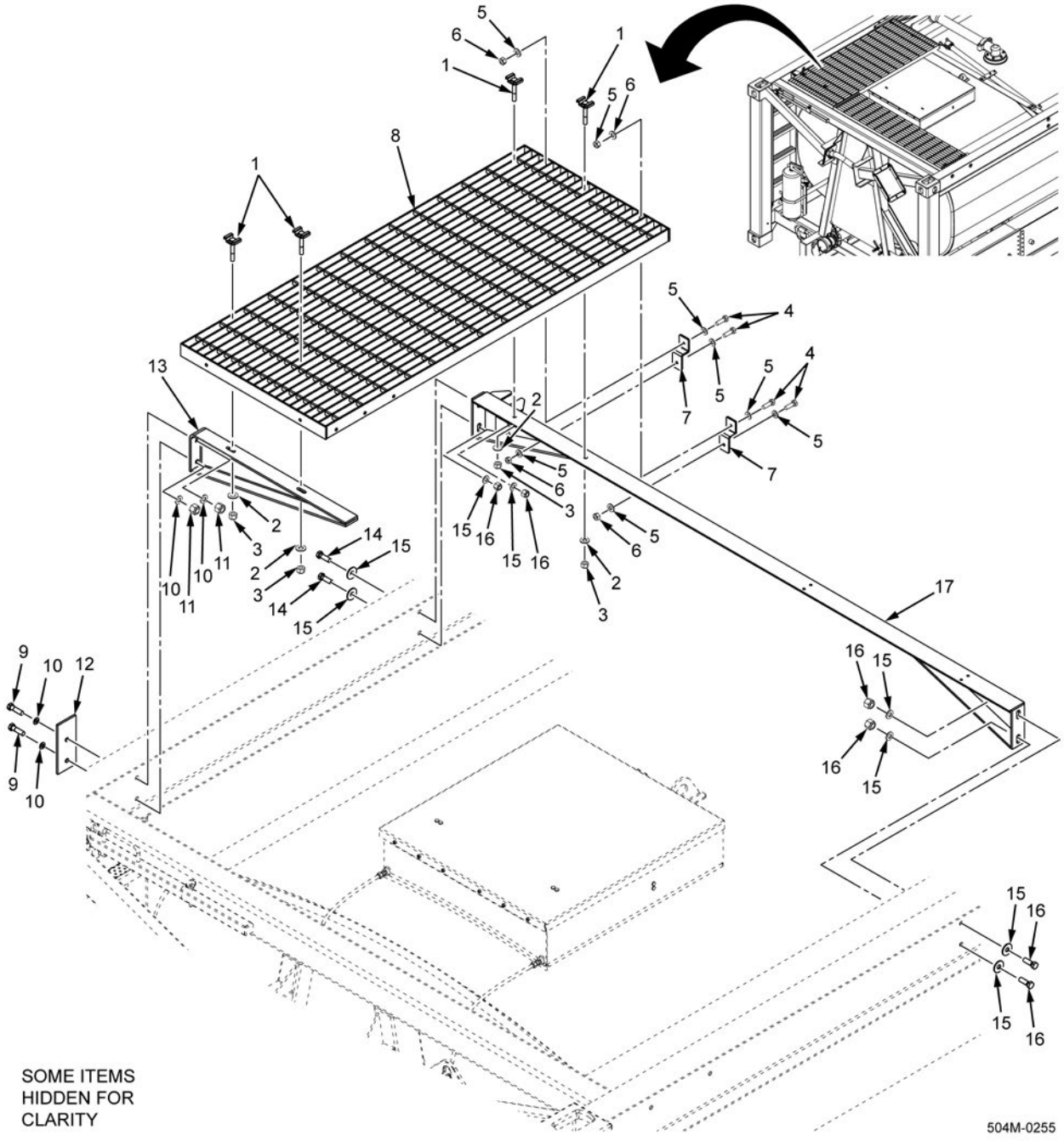


Figure 3. Ladder-Side Front Catwalk Grate.

END OF TASK

INSTALLATION

1. Install front catwalk span (Figure 3, Item 17) using four bolts (Figure 3, Item 14), eight flat washers (Figure 3, Item 13), and four new locknuts (Figure 3, Item 16).
2. Install catwalk ladder-side mount bracket (Figure 3, Item 13) using two bolts (Figure 3, Item 9), four flat washers (Figure 3, Item 10), two new locknuts (, Item 11), and one catwalk doubler (Figure 3, Item 12).
3. Install front catwalk lap bracket (Figure 2, Item 15) using two bolts (Figure 2, Item 12), four flat washers (Figure 2, Item 13), and two new locknuts (Figure 2, Item 14).
4. Install ladder-side front catwalk grate (Figure 3, Item 8).
5. Loosely install four saddle clips (Figure 3, Item 1), four flat washers (Figure 3, Item 2), and four new locknuts (Figure 3, Item 3).
6. Loosely install two catwalk Z brackets (Figure 3, Item 7) using four bolts (Figure 3, Item 4), eight flat washers (Figure 3, Item 5), and four new locknuts (Figure 3, Item 6).
7. Install front catwalk forward grate (Figure 2, Item 1).
8. Install three bolts (Figure 1, Item 4), six flat washers (Figure 1, Item 2), three spacers (Figure 1, Item 3), and three new locknuts (Figure 1, Item 1).
9. Loosely install two saddle clips (Figure 2, Item 2), two flat washers (Figure 2, Item 3), and two new locknuts (Figure 2, Item 4).
10. Loosely install catwalk lap bracket stop (Figure 2, Item 11) using one bolt (Figure 2, Item 5), flat washer (Figure 2, Item 6), and new locknut (Figure 2, Item 7).
11. Loosely install catwalk lap bracket stop (Figure 2, Item 11), using one bolt (Figure 2, Item 8), two flat washers (Figure 2, Item 9), and new locknut (Figure 2, Item 10).
12. Tighten four bolts (Figure 3, Item 4), two flat washers (Figure 2, Item 5), and nut (Figure 2, Item 6) on catwalk Z brackets (Figure 3, Item 7).
13. Tighten six locknuts (Figure 3, Item 3) on six saddle clips (Figure 3, Item 1).
14. Tighten bolts (Figure 2, Item 5) on catwalk lap bracket (Figure 2, Item 11).

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install handrail (WP 0067).
2. Install gauge tube (WP 0062).

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
REAR CATWALK ASSEMBLY REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool kit, general mechanic's (WP 0217, Table 1, Item 13)

Materials/Parts
Nut, self-locking, hexagon (LOCKNUTS) Qty: 6 (WP 0159, Figure 13, Item 8)
Nut, self-locking, hexagon (LOCKNUTS) Qty: 4 (WP 0159, Figure 13, Item 13)
Rear catwalk grate (WP 0159, Figure 13, Item 6)

Personnel Required
91J Quartermaster and Chemical Equipment Repairer (2)

References
TM 10-4930-371-10

Equipment Condition
MFS TRM on ground (TM 10-4930-371-10)
MFS TRM shut down (TM 10-4930-371-10)
MFS TRM rear handhold raised (TM 10-4930-371-10)
MFS TRM ladder emplaced (TM 10-4930-371-10)

Time to Complete
1.0 Hour(s)

REMOVAL

NOTE

Note orientation of hardware and components to aid in installation.

1. Remove s-hook (Figure 1, Item 17) from rear catwalk (Figure 1, Item 1).
2. Remove four locknuts (Figure 1, Item 13), four flat washers (Figure 1, Item 14), and four saddle clips (Figure 1, Items 2 and 6). Discard locknuts.
3. Remove two bolts (Figure 1, Item 4), four flat washers (Figure 1, Items 3 and 16), two locknuts (Figure 1, Item 15), and two catwalk hat brackets (Figure 1, Item 5). Discard locknuts.
4. Remove rear catwalk (Figure 1, Item 1).
5. Remove two bolts (Figure 1, Item 10), four flat washers (Figure 1, Items 9 and 11), one catwalk doubler (Figure 1, Item 8), two locknuts (Figure 1, Item 12), and one right catwalk mount bracket (Figure 1, Item 7). Discard locknuts.
6. Remove two bolts (Figure 1, Item 10), four flat washers (Figure 1, Items 9 and 11), one catwalk doubler (Figure 1, Item 8), two locknuts (Figure 1, Item 12), and one left catwalk mount bracket (Figure 1, Item 16). Discard locknuts.

REMOVAL - Continued

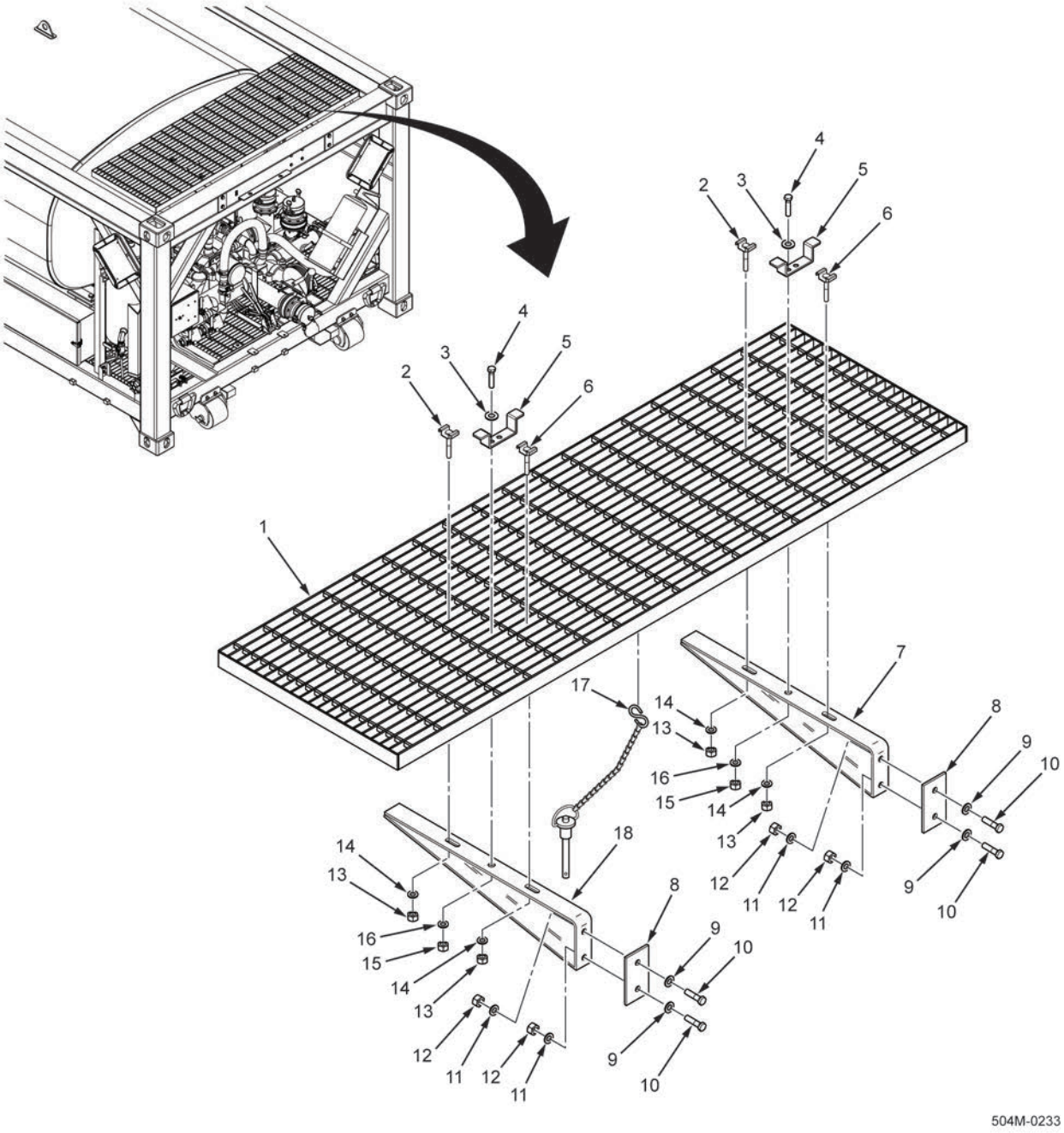


Figure 1. Rear Catwalk Removal.

END OF TASK

INSTALLATION

1. Install one left catwalk mount bracket (Figure 1, Item 16) with two bolts (Figure 1, Item 10), four flat washers (Figure 1, Items 9 and 11), one catwalk doubler (Figure 1, Item 8), and two new locknuts (Figure 1, Item 12).
2. Install one right catwalk mount bracket (Figure 1, Item 7) with two bolts (Figure 1, Item 10), four flat washers (Figure 1, Items 9 and 11), one catwalk doubler (Figure 1, Item 8), and two new locknuts (Figure 1, Item 12).
3. Install rear catwalk (Figure 1, Item 1).
4. Loosely install two catwalk hat brackets (Figure 1, Item 5) with two bolts (Figure 1, Item 4), four flat washers (Figure 1, Items 3 and 16), and two new locknuts (Figure 1, Item 15).
5. Loosely install four saddle clips (Figure 1, Items 2 and 6), four flat washers (Figure 1, Item 14), and four new locknuts (Figure 1, Item 13).
6. Tighten two bolts (Figure 1, Item 4).
7. Tighten four locknuts (Figure 1, Item 13) on saddle clips (Figure 1, Items 2 and 6).
8. Install s-hook (Figure 1, Item 17) on rear catwalk (Figure 1, Item 1).

END OF TASK

FOLLOW-ON MAINTENANCE

1. Lower rear handhold (TM 10-4930-371-10).
2. Stow ladder (TM 10-4930-371-10).

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
FRONT HANDHOLD ASSEMBLY REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool kit, general mechanic's (WP 0217, Table 1, Item 13)

Equipment Condition
MFS TRM shut down (TM 10-4930-371-10)
MFS TRM grounded (TM 10-4930-371-10)

Materials/Parts
Nut, self-locking, hexagon (LOCKNUTS) (WP 0160, Figure 14, Item 6)
Hand hold handle (WP 0160, Figure 14, Item 2)

Time to Complete
0.2 Hour(s)

Personnel Required
91J Quartermaster and Chemical Equipment Repairer

REMOVAL

1. Remove locking pin (Figure 1, Item 6).
2. Remove bolt (Figure 1, Item 1), two flat washers (Figure 1, Item 2), and locknut (Figure 1, Item 4), and remove handhold assembly (Figure 1, Item 3). Discard locknut.
3. Remove s-hook (Figure 1, Item 7), chain (Figure 1, Item 5), and pin (Figure 1, Item 6) from handhold mount (Figure 1, Item 8).

END OF TASK

INSTALLATION

CAUTION

Do not overtighten cable clamps. Damage to equipment could occur.

1. Install new handhold assembly (Figure 1, Item 3), and secure with bolt (Figure 1, Item 1), two flat washers (Figure 1, Item 2), and new locknut (Figure 1, Item 4).
2. Install s-hook (Figure 1, Item 7), chain (Figure 1, Item 5), and pin (Figure 1, Item 6) on handhold mount (Figure 1, Item 8).
3. Lower new handhold assembly (Figure 1, Item 3), and secure in place with locking pin (Figure 1, Item 6).

INSTALLATION - Continued

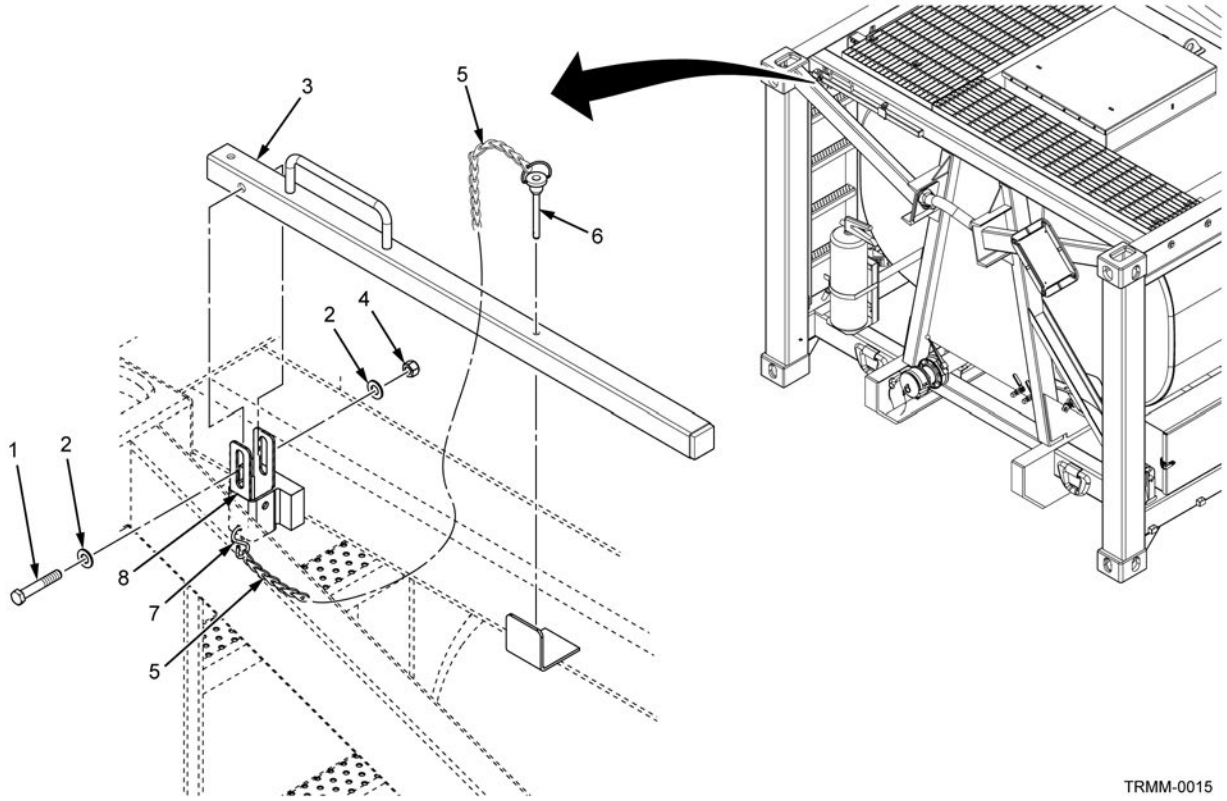


Figure 1. Replacing Handhold Assembly.

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
REAR HANDHOLD ASSEMBLY REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool kit, general mechanic's (WP 0217, Table 1, Item 13)

Materials/Parts
Nut, self-locking, hexagon (LOCKNUTS) Qty: 2 (WP 0161, Figure 15, Item 9)
Nut, self-locking, hexagon (LOCKNUTS) Qty: 5 (WP 0161, Figure 15, Item 11)
Hand hold handle (WP 0161, Figure 15, Item 2)

Personnel Required
91J Quartermaster and Chemical Equipment Repairer

Equipment Condition
MFS TRM grounded (TM 10-4930-371-10)
MFS TRM shut down (TM 10-4930-371-10)

Time to Complete
0.5 Hour(s)

REMOVAL

1. Remove quick release pin (Figure 1, Item 4) from stow rest bracket (Figure 1, Item 10) and rear handhold (Figure 1, Item 1).
2. Remove one bolt (Figure 1, Item 14), two flat washers (Figure 1, Item 6), and one locknut (Figure 1, Item 12). Discard locknut.
3. Remove rear handhold (Figure 1, Item 1).
4. Remove four bolts (Figure 1, Item 5), eight flat washers (Figure 1, Item 6), four locknuts (Figure 1, Item 12), and remove handhold cradle (Figure 1, Item 13). Discard locknuts.
5. Remove two bolts (Figure 1, Item 8), four flat washers (Figure 1, Item 9), and two locknuts (Figure 1, Item 11), and remove stow rest bracket (Figure 1, Item 10). Discard locknuts.
6. Remove s-hook (Figure 1, Item 2) and chain (Figure 1, Item 3) from rear catwalk (Figure 1, Item 7).

REMOVAL - Continued

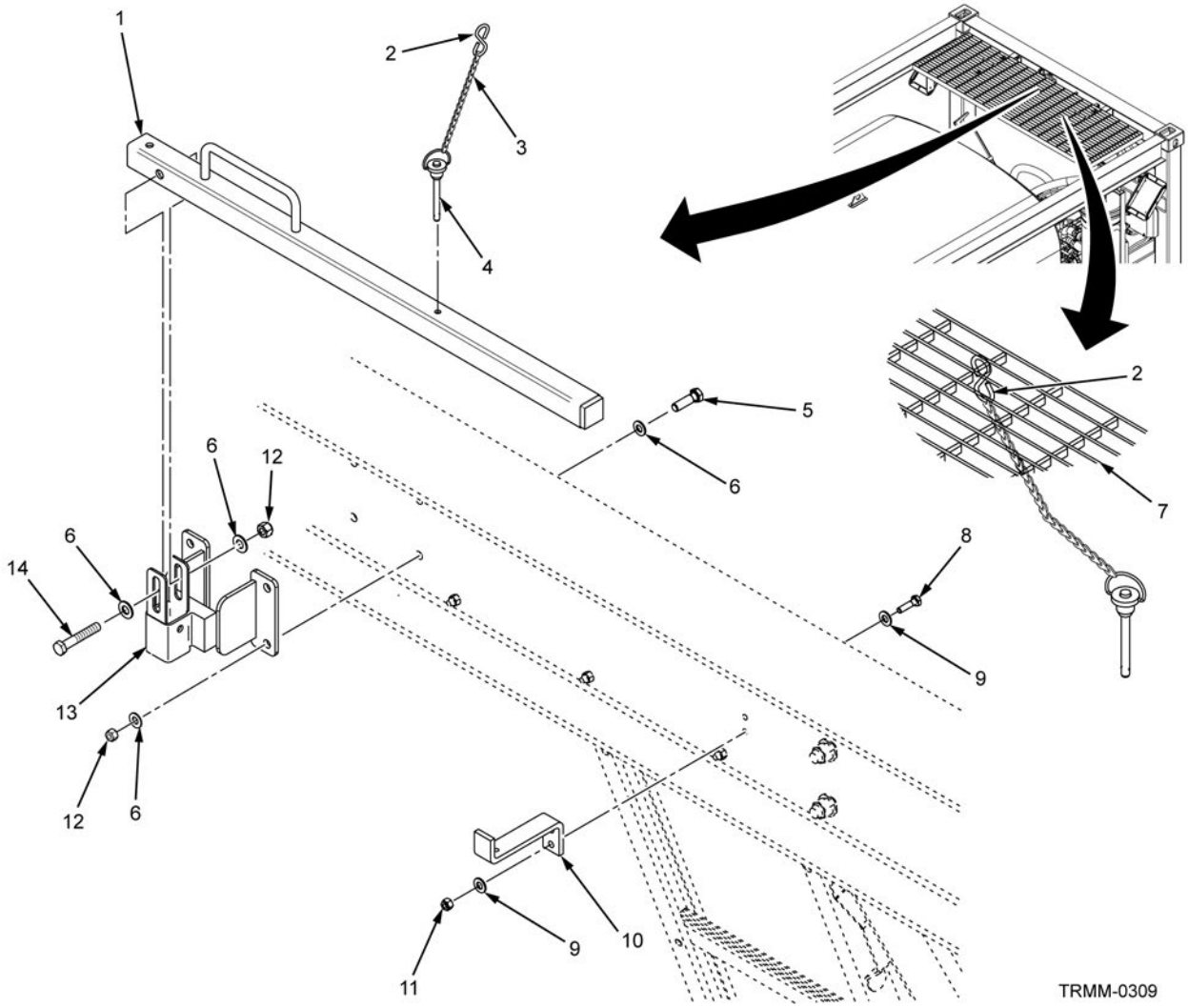


Figure 1. Replacing Rear Handhold Assembly.

END OF TASK

INSTALLATION

1. Install s-hook (Figure 1, Item 2) and chain (Figure 1, Item 3) on rear catwalk (Figure 1, Item 7).

NOTE

Do not overtighten bolt connecting handhold to cradle and locknut. Handhold assembly should be able to pivot up into vertical position and slide down into socket when installed.

2. Install stow rest bracket (Figure 1, Item 10) using two bolts (Figure 1, Item 8), four flat washers (Figure 1, Item 9), and two new locknuts (Figure 1, Item 11).
3. Install handhold cradle (Figure 1, Item 13) using four bolts (Figure 1, Item 5), eight flat washers (Figure 1, Item 6), and four new locknuts (Figure 1, Item 12).

INSTALLATION - Continued

4. Install rear handhold (Figure 1, Item 1) into cradle using one bolt (Figure 1, Item 14), two flat washers (Figure 1, Item 6), and one new locknut (Figure 1, Item 12).
5. Lower new rear handhold assembly (Figure 1, Item 1) and secure in place with quick release pin (Figure 1, Item 4).

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
HANDRAIL ASSEMBLY REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool kit, general mechanic's (WP 0217, Table 1, Item 13)

Materials/Parts
Nut, self-locking, hexagon (LOCKNUTS) Qty: 2 (WP 0162, Figure 16, Item 2)
Handrail Assembly (WP 0162, Figure 16, Item 1)

Personnel Required
91J Quartermaster and Chemical Equipment Repairer (2)

Equipment Condition
MFS TRM grounded (TM 10-4930-371-10)
MFS TRM shut down (TM 10-4930-371-10)

Time to Complete
1 Hour(s)

REMOVAL

Remove two screws (Figure 1, Item 1), four flat washers (Figure 1, Items 2), and two locknuts (Figure 1, Item 3) and remove handrail assembly (Figure 1, Item 4). Discard locknuts.

REMOVAL - Continued

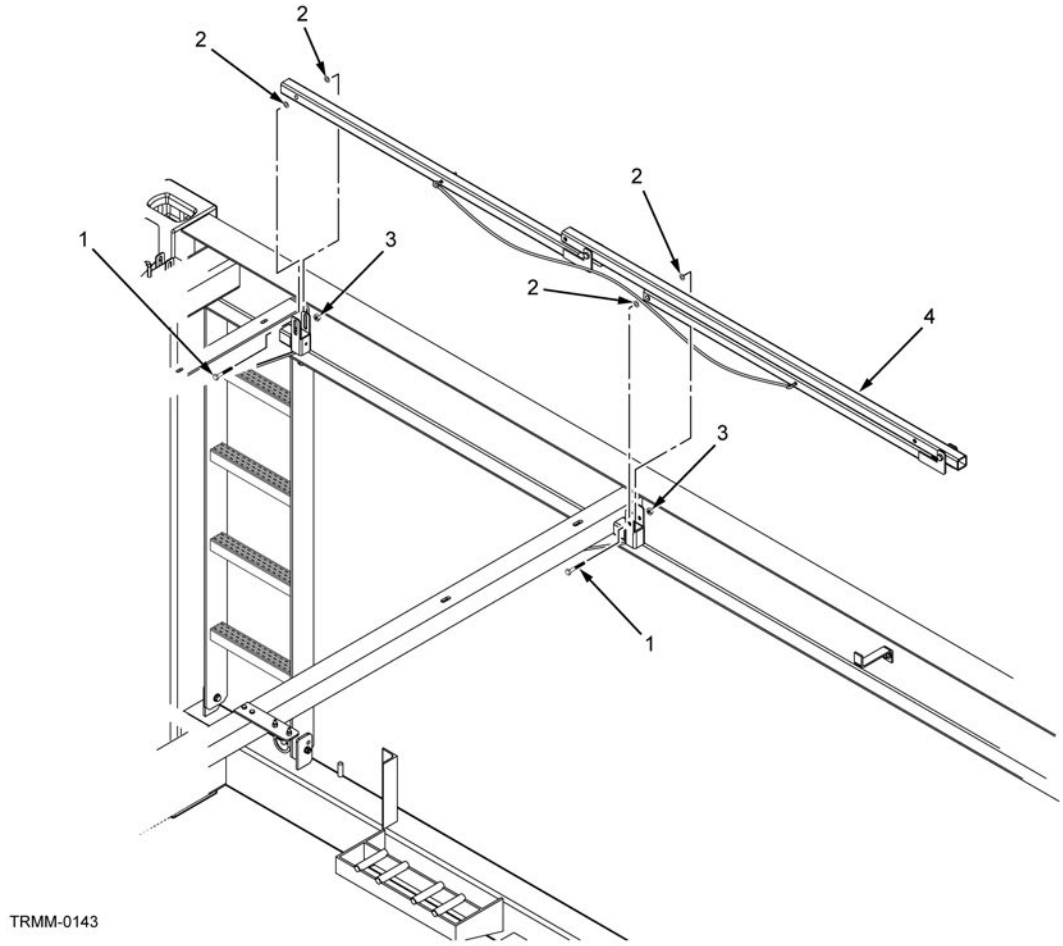


Figure 1. Replacing Handrail Assembly.

END OF TASK

INSTALLATION

NOTE

Do not overtighten locknuts as handrail side rails must be free to be raised and lowered in side rail support brackets.

Install handrail assembly (Figure 1, Item 4) and secure with two screws (Figure 1, Item 1), four flat washers (Figure 1, Item 2), and two new locknuts (Figure 1, Item 3).

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
HANDRAIL ASSEMBLY REPAIR

INITIAL SETUP:

Tools and Special Tools
Tool kit, general mechanic's (WP 0217, Table 1, Item 13)

Materials/Parts
Nut, self-locking, hexagon (LOCKNUTS) Qty: 2 (WP 0162, Figure 16, Item 2)
Nut, self-locking, hexagon (LOCKNUTS) Qty: 2 (WP 0162, Figure 16, Item 10)
Handrail Assembly (WP 0162, Figure 16, Item 1)

Personnel Required
91J Quartermaster and Chemical Equipment Repairer

References
WP 0067

Equipment Condition
MFS TRM shut down (TM 10-4930-371-10)
MFS TRM grounded (TM 10-4930-371-10)
Handrail removed (WP 0067)

Time to Complete
0.5 Hour(s)

DISASSEMBLY

NOTE

Disassemble the handrail assembly only to the point required to replace defective components.

1. Remove two bolts (Figure 1, Item 1), four flat washers (Figure 1, item 2), and two locknuts (Figure 1, Item 3) to remove top rail (Figure 1, item 11) from side rail (Figure 1, item 6). Discard locknuts.
2. Remove two locknuts (Figure 1, Item 4), two flat washers (Figure 1, Item 5), and two eyebolts (Figure 1, Item 9) to remove cable (Figure 1, Item 12). Discard locknuts.
3. Remove four nuts (Figure 1, Item 7) and two loop clamps (Figure 1, Items 8 and 10) from cable (Figure 1, Item 12).

DISASSEMBLY - Continued

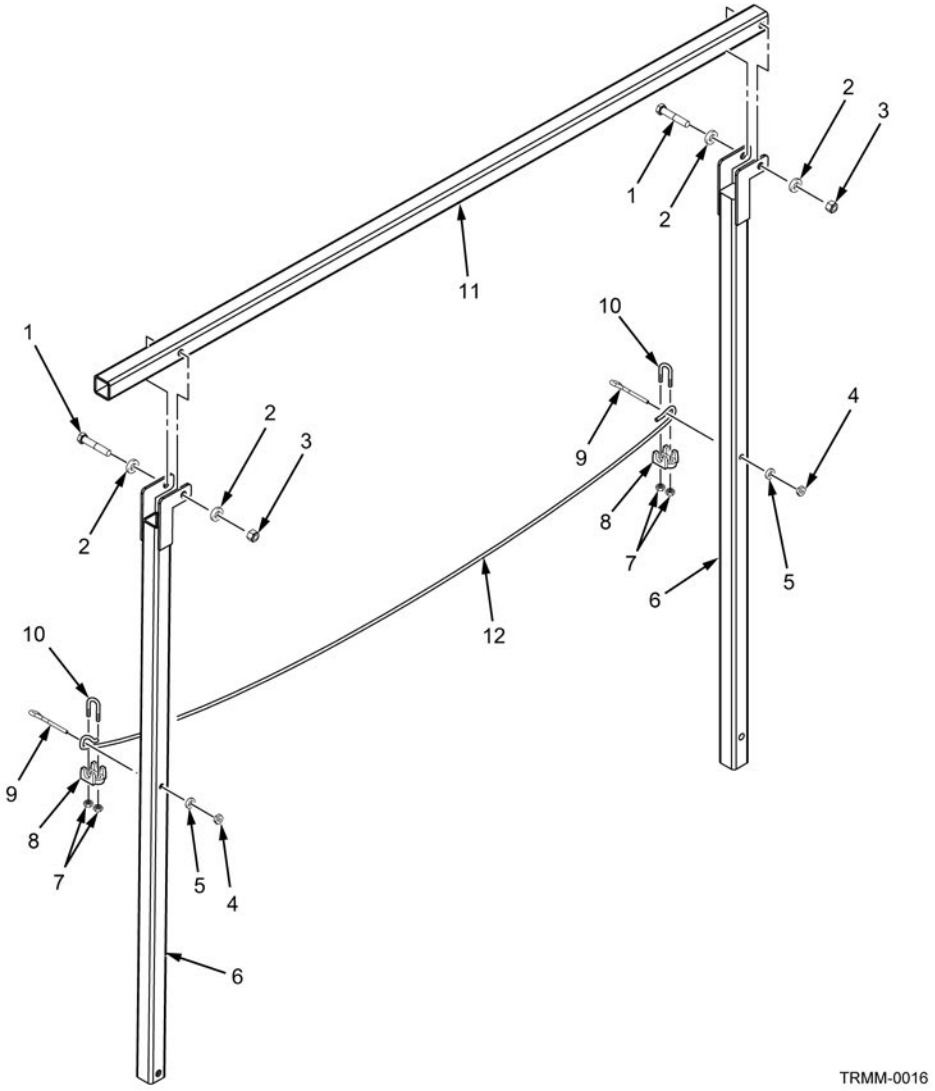


Figure 1. Replacing Handrail Assembly Components.

END OF TASK

ASSEMBLY

1. Insert cable (Figure 1, Item 12) through eyebolt (Figure 1, Item 9).
2. Bend cable (Figure 1, Item 12) approximately 2 in. to create a loop at end of cable.
3. Install end of loop through loop clamp (Figure 1, Items 8 and 10) and secure with two nuts (Figure 1, Item 7).
4. Repeat steps 1 through 3 for other end of cable.
5. Install two new locknuts (Figure 1, Item 4), two flat washers (Figure 1, Item 5), and two eyebolts (Figure 1, Item 9) to install cable (Figure 1, Item 12) to two side rails (Figure 1, Item 6).

ASSEMBLY - Continued

6. Replace two bolts (Figure 1, Item 1), four flat washers (Figure 1, Item 2), and two new locknuts (Figure 1, Item 3) to assemble top rail (Figure 1, Item 11) to two side rails (Figure 1, Item 6).

END OF TASK

FOLLOW-ON MAINTENANCE

Install handrail (WP 0067).

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
ROLLER WHEEL ASSEMBLIES REPAIR

INITIAL SETUP:

Tools and Special Tools
Tool kit, general mechanic's (WP 0217, Table 1, Item 13)

Personnel Required
91J Quartermaster and Chemical Equipment Repairer

References
WP 0163

Equipment Condition
MFS TRM grounded (TM 10-4930-371-10)

Equipment Condition (cont.)
MFS TRM shut down (TM 10-4930-371-10)
MFS TRM roller wheels removed from stowed position (TM 10-4930-371-10)

Time to Complete
0.1 Hour(s)

DISASSEMBLY

NOTE

- Note orientation of hardware and components to aid in installation.
- Left and right roller wheels have the same disassembly and assembly procedures.

1. Remove cotter pin (Figure 1, Item 4). Discard cotter pin.
2. Remove roller wheel pin (Figure 1, Item 2), bushing (Figure 1, Item 5), and roller wheel (Figure 1, Item 3) from mounting bracket (Figure 1, Item 1).

DISASSEMBLY - Continued

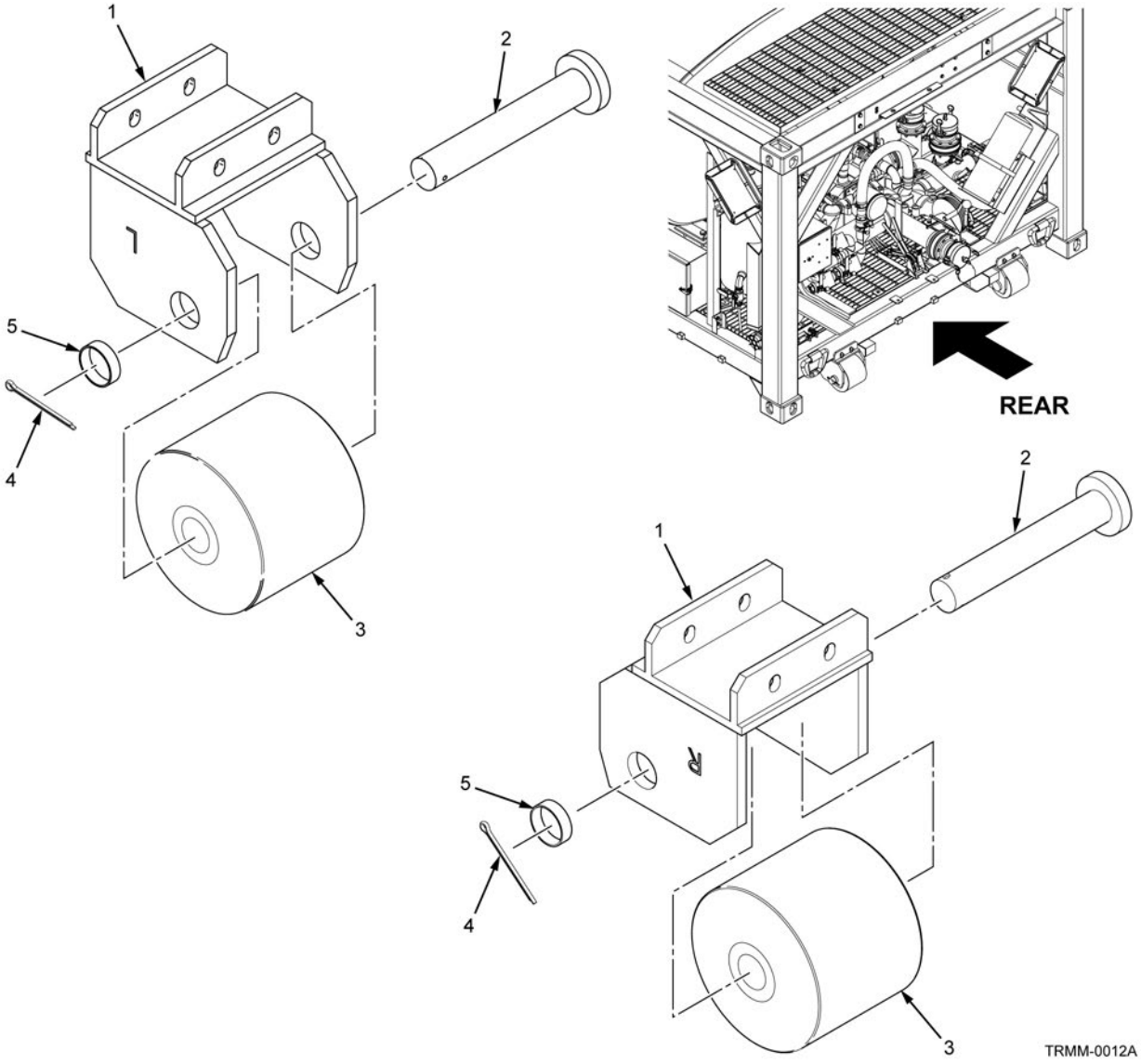


Figure 1. Roller Wheel Assemblies.

END OF TASK

ASSEMBLY

1. Assemble roller wheel (Figure 1, Item 3), roller wheel pin (Figure 1, Item 2), and bushing (Figure 1, Item 5) on mounting bracket (Figure 1, Item 1).
2. Install new cotter pin (Figure 1, Item 4) to secure roller wheel (Figure 1, Item 3) in mounting bracket (Figure 1, Item 1).

END OF TASK

FOLLOW-ON MAINTENANCE

Install roller wheels in the stowed position (WP 0163).

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
HOSE MOUNT GRATE REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Gloves, disposable nitrile (WP 0216, Table 1, Item 5)
- Pan, drip (WP 0217, Table 1, Item 8)

Materials/Parts
- Cable tie (WP 0216, Table 1, Item 8)
- Gasket (WP 0184, Figure 38, Item 3)
- Nut, self-locking, hexagon (LOCKNUTS) (WP 0179, Figure 33, Item 2)
- Nut, self-locking, hexagon (LOCKNUTS) (WP 0181, Figure 35, Item 6)
- Nut, self-locking, hexagon (LOCKNUTS) (WP 0183, Figure 37, Item 3)
- Nut, self-locking, hexagon (LOCKNUTS) Qty: 5 (WP 0164, Figure 18, Item 6)
- Washer, lock Qty: 2 (WP 0183, Figure 37, Item 4)

Materials/Parts (cont.)
- Washer, lock Qty: 2 (WP 0164, Figure 18, Item 4)
- Hose Mount Grate (WP 0164, Figure 18, Item 7)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer (2)

References
- ATP 4-43
- TM 10-4930-371-10

Equipment Condition
- MFS TRM grounded (TM 10-4930-371-10)
- MFS TRM shut down (TM 10-4930-371-10)
- MFS TRM drained (TM 10-4930-371-10)

Time to Complete
- 1 Hour(s)

REMOVAL

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Failure to comply could result in injury or death to personnel.

REMOVAL - Continued

NOTE

Note orientation of hardware and components to aid in installation.

1. Place drip pan under right side piping (Figure 1, Item 1).
2. Cut cable tie (Figure 1, Item 6). Discard cable tie.
3. Remove tube nut (Figure 1, Item 8) and product line (Figure 1, Item 7).
4. Remove bolt (Figure 1, Item 17), two flat washers (Figure 1, Item 11), grating clasp (Figure 1, Item 16), and one locknut (Figure 1, Item 10) from bracket (Figure 1, Item 12) on port A (Figure 1, Item 20). Discard locknut.
5. Remove bolt (Figure 1, Item 18), two flat washers (Figure 1, Item 14), grating clasp (Figure 1, Item 19), and one locknut (Figure 1, Item 13) from bracket (Figure 1, Item 15) on port B (Figure 1, Item 21). Discard locknut.
6. Remove two bolts (Figure 1, Item 9), nuts (Figure 1, Item 3), and coupling halves (Figure 1, Item 2) from right side piping (Figure 1, Item 1) and remove right side piping (Figure 1, Item 1) from bottom piping (Figure 1, Item 5).
7. Remove and discard gasket (Figure 1, Item 4).

REMOVAL - Continued

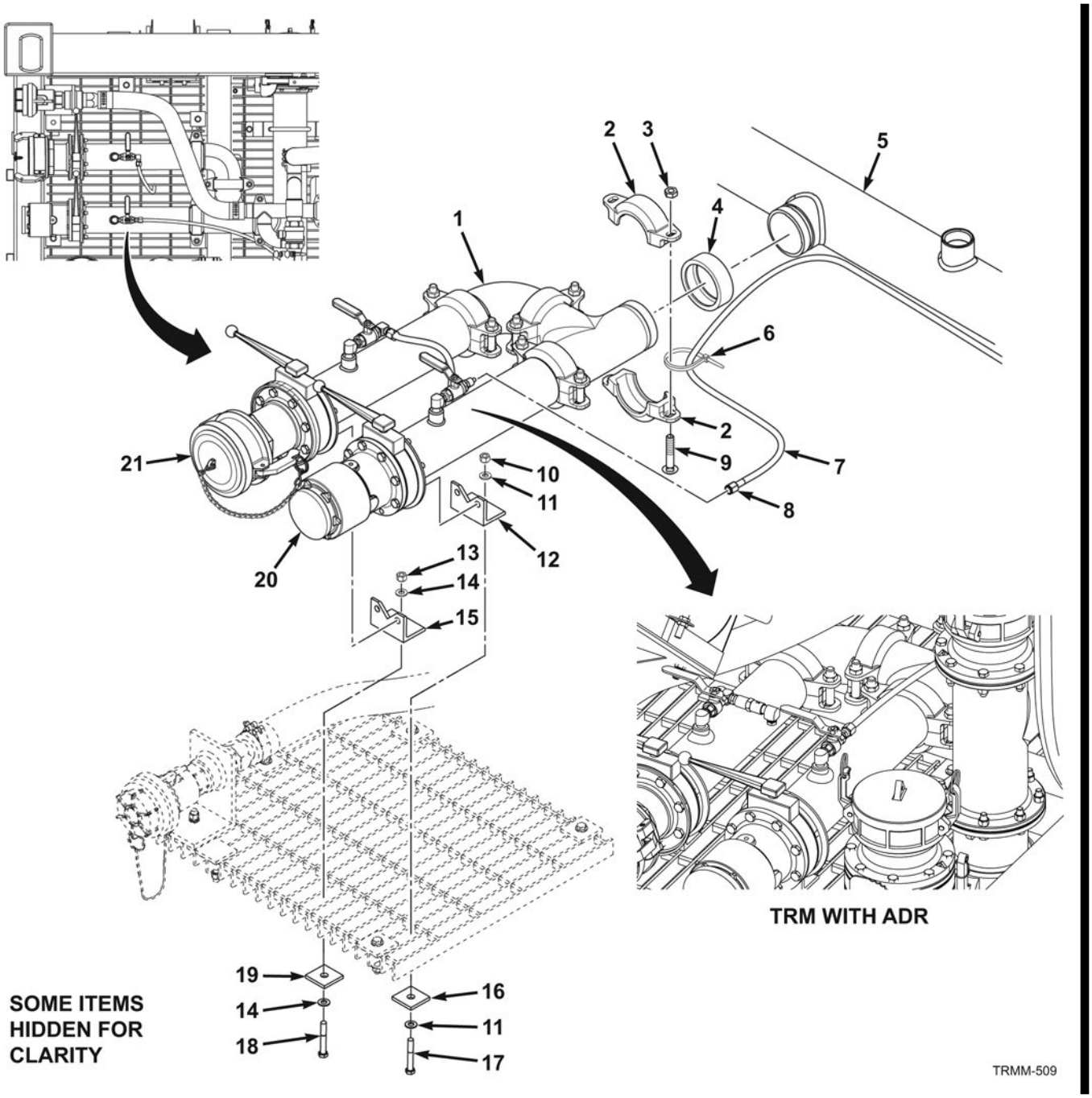


Figure 1. Right Side Piping Removal.

8. Remove bolt (Figure 2, Item 1), two internal lock washers (Figure 2, Item 3), ground strap (Figure 2, Item 6), locknut (Figure 2, Item 2), and grating clasp (Figure 2, Item 4) which secures the (V7) port E valve bracket (Figure 2, Item 5) and ground strap (Figure 2, Item 6), to grate (Figure 2, Item 9). Push hose aside. Discard locknut and lock washers.

REMOVAL - Continued

9. Remove five locknuts (Figure 2, Item 2), bolts (Figure 2, Item 1), eight flat washers (Figure 2, Item 8), two lock washers (Figure 2, Item 8), and five grating clasps (Figure 2, Item 4). Discard locknuts and lock washers.
10. Remove hose mount grate (Figure 2, Item 9) from MFS TRM frame (Figure 2, Item 7).
11. Dispose of fuel IAW unit SOP.

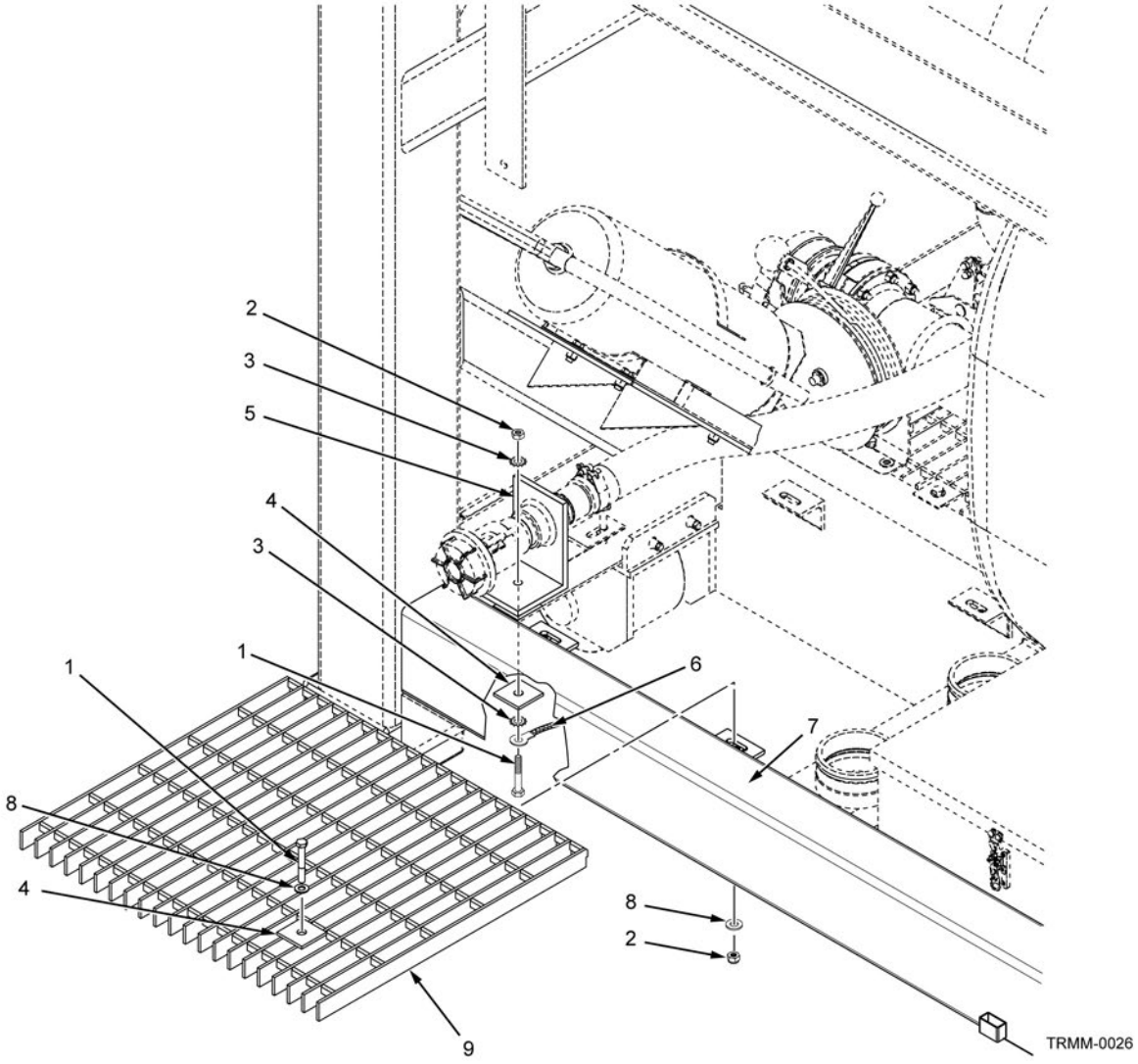


Figure 2. Hose Mount Grate.

END OF TASK

INSTALLATION

1. Install hose mount grate (Figure 2, Item 9) in MFS TRM (Figure 2, Item 7) as noted during removal.

INSTALLATION - Continued

2. Install five bolts (Figure 2, Item 1), eight flat washers (Figure 2, Item 8), two new lock washers (Figure 2, Item 8), five new locknuts (Figure 2, Item 2), and grating clasps (Figure 2, Item 4) to secure grate (Figure 2, Item 9) to frame (Figure 2, Item 7).
3. Install bolt (Figure 2, Item 1), two internal lock washers (Figure 2, Item 3), new locknut (Figure 2, Item 2), ground strap (Figure 2, Item 6) and grating clasp (Figure 2, Item 4) to secure (V7) port E valve bracket (Figure 2, Item 5) to grate (Figure 2, Item 9).
4. Lightly lubricate new gasket (Figure 3, Item 4) with fuel and install on right side piping (Figure 3, Item 1).
5. Install right side piping (Figure 3, Item 1) and slide gasket (Figure 3, Item 4) onto bottom piping (Figure 3, Item 5) so that half the gasket (Figure 3, Item 4) remains on right side piping (Figure 3, Item 1).
6. Install coupling halves (Figure 3, Item 2) using two bolts (Figure 3, Item 9) and nuts (Figure 3, Item 3). Ensure coupling halves are touching.
7. Secure bracket (Figure 3, Item 15) with one bolt (Figure 3, Item 18), two flat washers (Figure 3, Item 14), grating clasp (Figure 3, Item 19) and new locknut (Figure 3, Item 13) on port B (Figure 3, Item 21).
8. Secure bracket (Figure 3, Item 12) with one bolt (Figure 3, Item 17), two flat washers (Figure 3, Item 11), grating clasp (Figure 3, Item 16), and new locknut (Figure 3, Item 10) on port A (Figure 3, Item 20).
9. Install product line (Figure 3, Item 7) and secure with tube nut (Figure 3, Item 8).
10. Install new cable tie (Figure 3, Item 6).

INSTALLATION - Continued

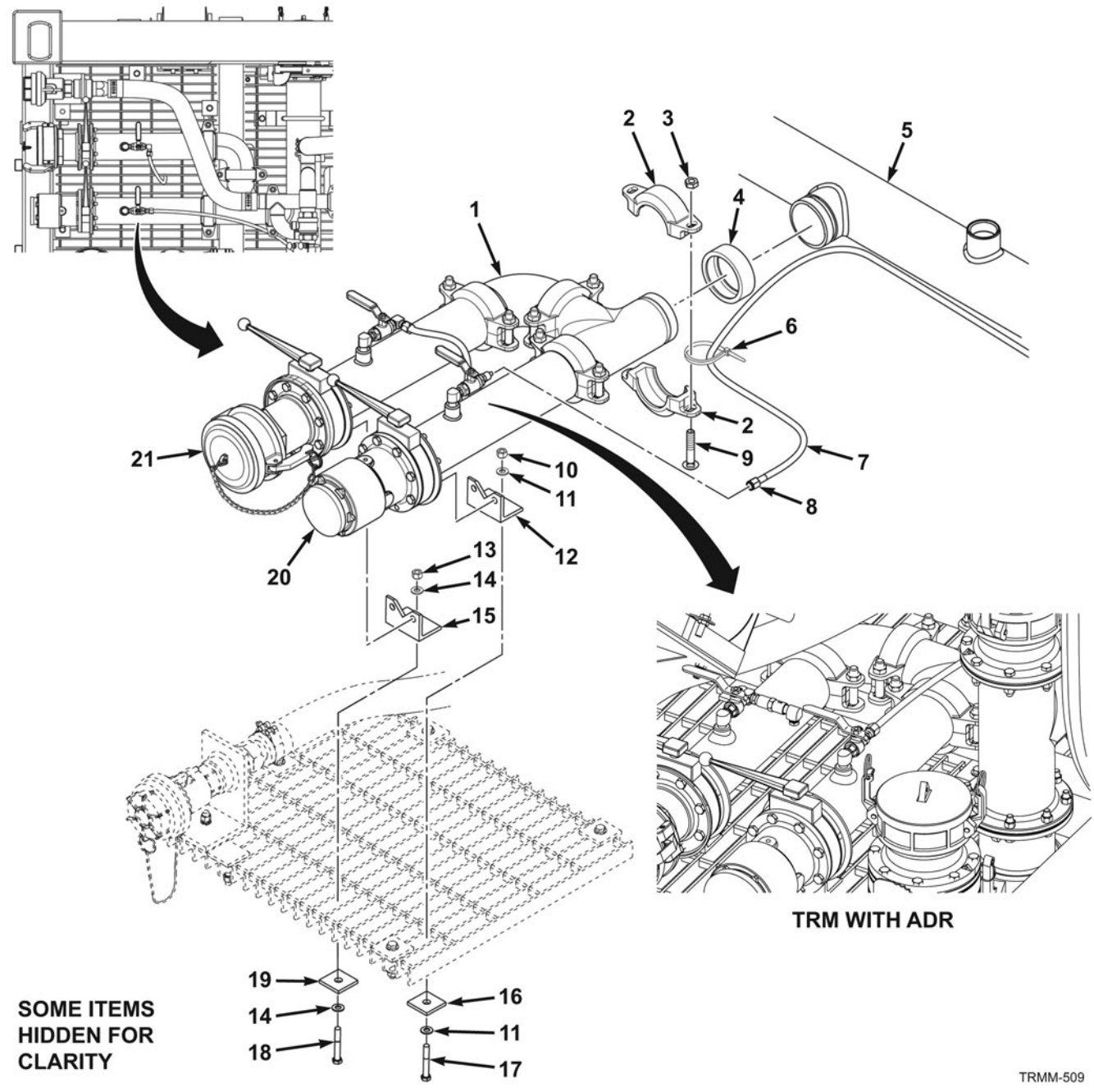


Figure 3. Right Side Piping Installation.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Set up MFS TRM (TM 10-4930-371-10).

FOLLOW-ON MAINTENANCE - Continued

2. Check MFS TRM for leaks by recirculating fuel (TM 10-4930-371-10).

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
FILTER DECK MOUNT GRATE AND H-BRACKET REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool kit, general mechanic's (WP 0217, Table 1, Item 13)

Materials/Parts
Cable tie Qty: 2 (WP 0216, Table 1, Item 14)
Nut, self-locking, hexagon (LOCKNUTS) Qty: 5 (WP 0165, Figure 19, Item 7)
Nut, self-locking, hexagon (LOCKNUTS) (WP 0177, Figure 31, Item 15)
Nut, self-locking, hexagon (LOCKNUTS) Qty: 2 (WP 0177, Figure 31, Item 17)
Nut, self-locking, hexagon (LOCKNUTS) (WP 0183, Figure 37, Item 3)
Nut, self-locking, hexagon (LOCKNUTS) (WP 0205, Figure 59, Item 24)
Washer, lock internal tooth Qty: 2 (WP 0165, Figure 19, Item 8)
Washer, lock internal tooth Qty: 2 (WP 0183, Figure 37, Item 4)

Materials/Parts (cont.)
H-Bracket (WP 0165, Figure 19, Item 9)
Filter deck mount grate (WP 0165, Figure 19, Item 10)

Personnel Required
91J Quartermaster and Chemical Equipment Repairer (2)

References
WP 0133

Equipment Condition
MFS TRM grounded (TM 10-4930-371-10)
MFS TRM drained (TM 10-4930-371-10)
Filter/Separator Assembly removed (WP 0133)

Time to Complete
4 Hour(s)

REMOVAL

NOTE

Note orientation of hardware and components to aid in installation.

1. Cut two cable ties.
2. Remove locknut (Figure 1, Item 11), two internal lock washers (Figure 1, Item 13), ground strap (Figure 1, Item 12), grating clasp (Figure 1, Item 10) and bolt (Figure 1, Item 5) from Port D (V8) mounting bracket (Figure 1, Item 7). Move mounting bracket as needed for grate removal (Figure 1, Item 9). Discard locknut and internal lock washers.
3. Remove locknut (Figure 1, Item 11), two flat washers (Figure 1, Item 6), grating clasp (Figure 1, Item 10), and bolt (Figure 1, Item 5) and remove differential pressure gauge assembly (Figure 1, Item 8). Discard locknut.
4. Remove two locknuts (Figure 1, Item 1), two flat washers (Figure 1, Item 2) and U-bolt (Figure 1, Item 4) from left side piping assembly support bracket (Figure 1, Item 3). Discard locknuts.
5. Remove locknut (Figure 1, Item 11), two flat washers (Figure 1, Item 6) and bolt (Figure 1, Item 5). Remove left side piping assembly support bracket (Figure 1, Item 3). Discard locknut.

REMOVAL - Continued

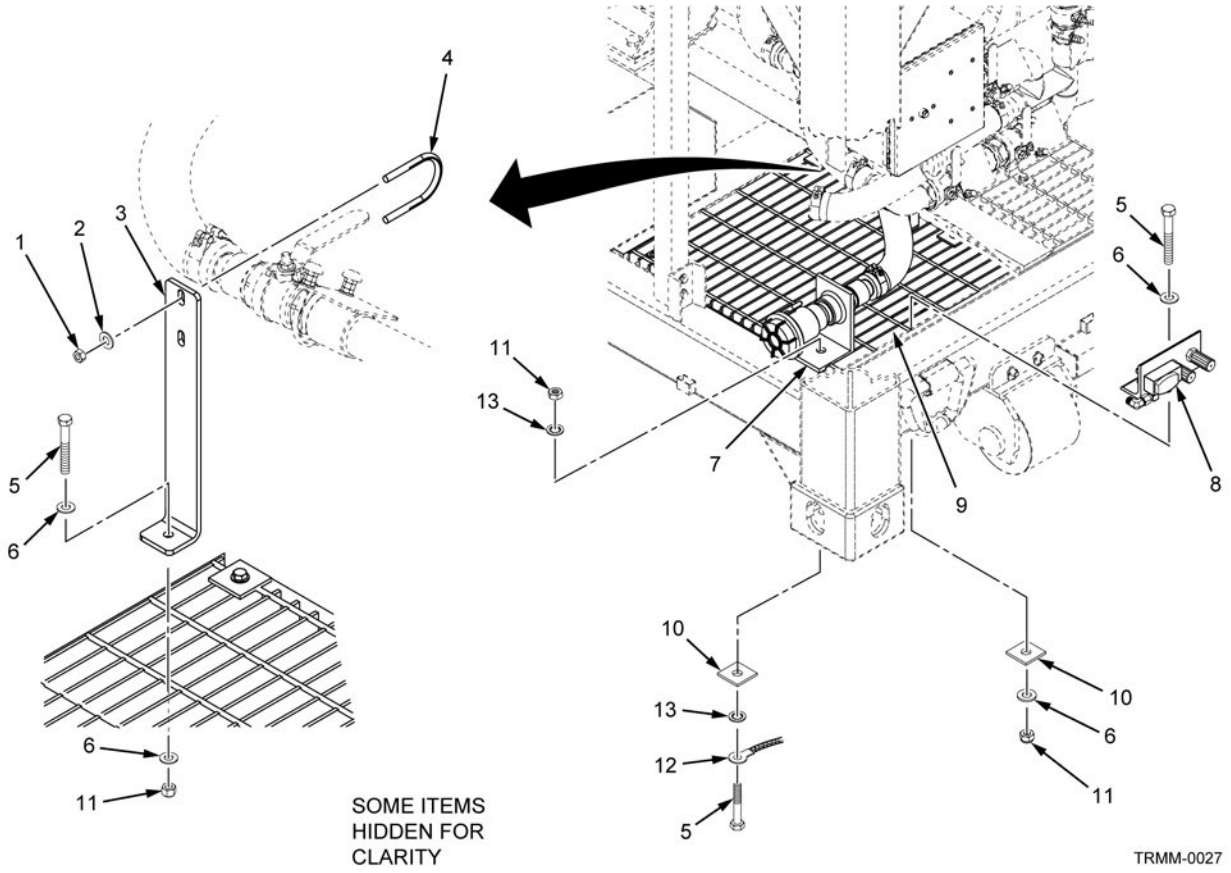


Figure 1. Removing Brackets.

6. Remove five locknuts (Figure 2, Item 3), bolts (Figure 2, Item 1), eight flat washers (Figure 2, Item 7), two internal lock washers (Figure 2, Item 4), ground straps (Figure 2, Item 2) and five grating clasps (Figure 2, Item 5) and remove filter deck mount grate (Figure 2, Item 8) from MFS TRM. Discard locknuts and internal lock washers.
7. Remove H-bracket (Figure 2, Item 6).

REMOVAL - Continued

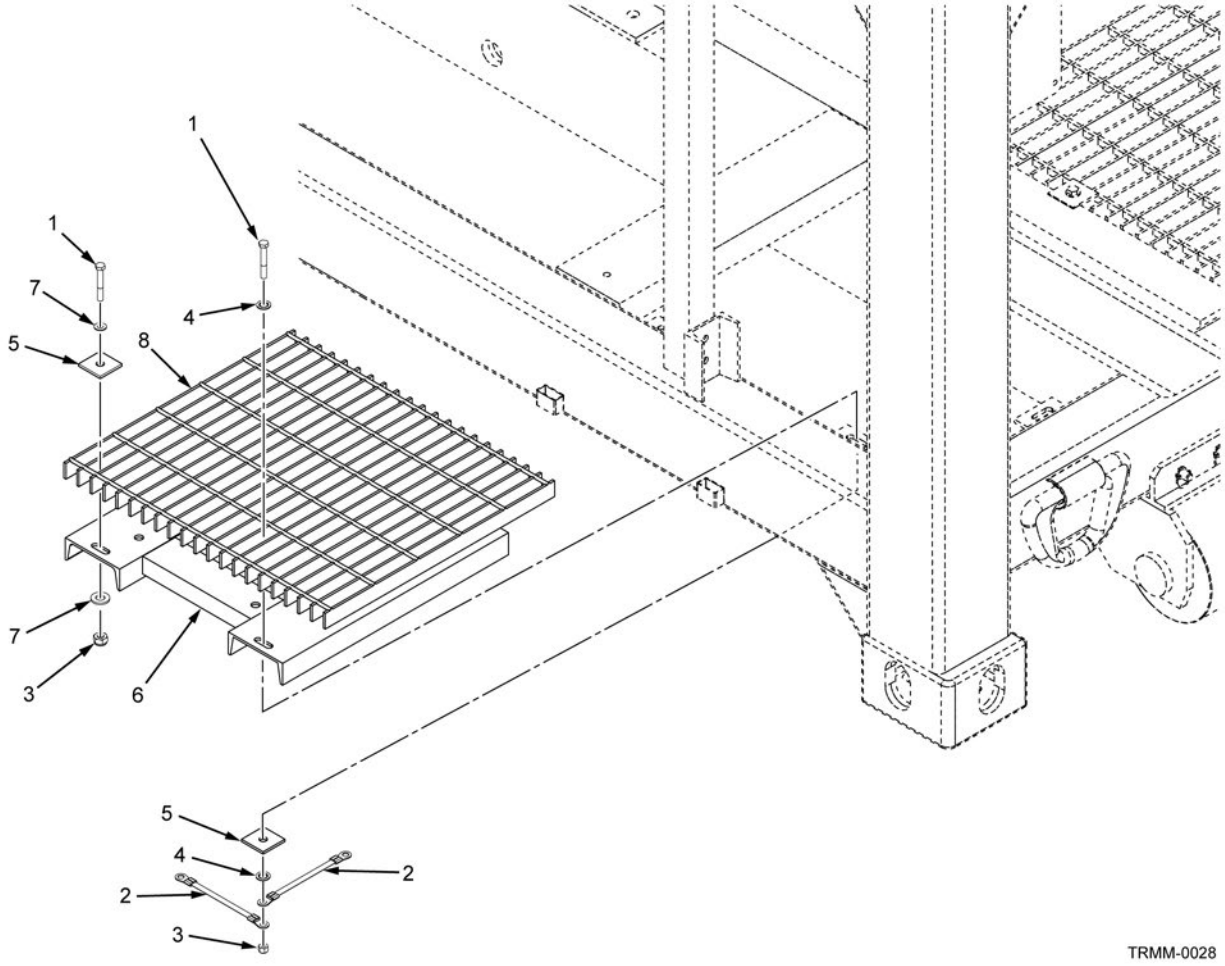


Figure 2. Filter Deck Mount Grate and H-Bracket.

END OF TASK

INSTALLATION

1. Install H-bracket (Figure 2, Item 6) and filter deck mount grate (Figure 2, Item 8).
2. Loosely install five new locknuts (Figure 2, Item 3), bolts (Figure 2, Item 1), eight flat washers (Figure 2, Item 7), two new internal lock washers (Figure 2, Item 4), ground straps (Figure 2, Item 2) and five grating clasps (Figure 2, Item 5).
3. Install bracket (Figure 3, Item 3) and secure with bolt (Figure 3, Item 5), two flat washers (Figure 3, Item 6) and new locknut (Figure 3, Item 11).
4. Tighten all locknuts (Figure 3, Item 11) and ensure holes for filter separator are clear.
5. Install U-bolt (Figure 3, Item 4) and secure with two new locknuts (Figure 3, Item 1) and flat washers (Figure 3, Item 2).
6. Install differential pressure gauge assembly (Figure 3, Item 8) and secure with bolt (Figure 3, Item 5), two flat washers (Figure 3, Item 6), new locknut (Figure 3, Item 11) and grating clasp (Figure 3, Item 10).

INSTALLATION - Continued

7. Move Port D bracket (Figure 3, Item 7) back into place on grate (Figure 3, Item 9) and secure using bolt (Figure 3, Item 5), two new internal lock washers (Figure 3, Item 13), ground strap (Figure 3, Item 12), new locknut (Figure 3, Item 11) and grating clasp (Figure 3, Item 10).
8. Install cable ties as noted during removal.

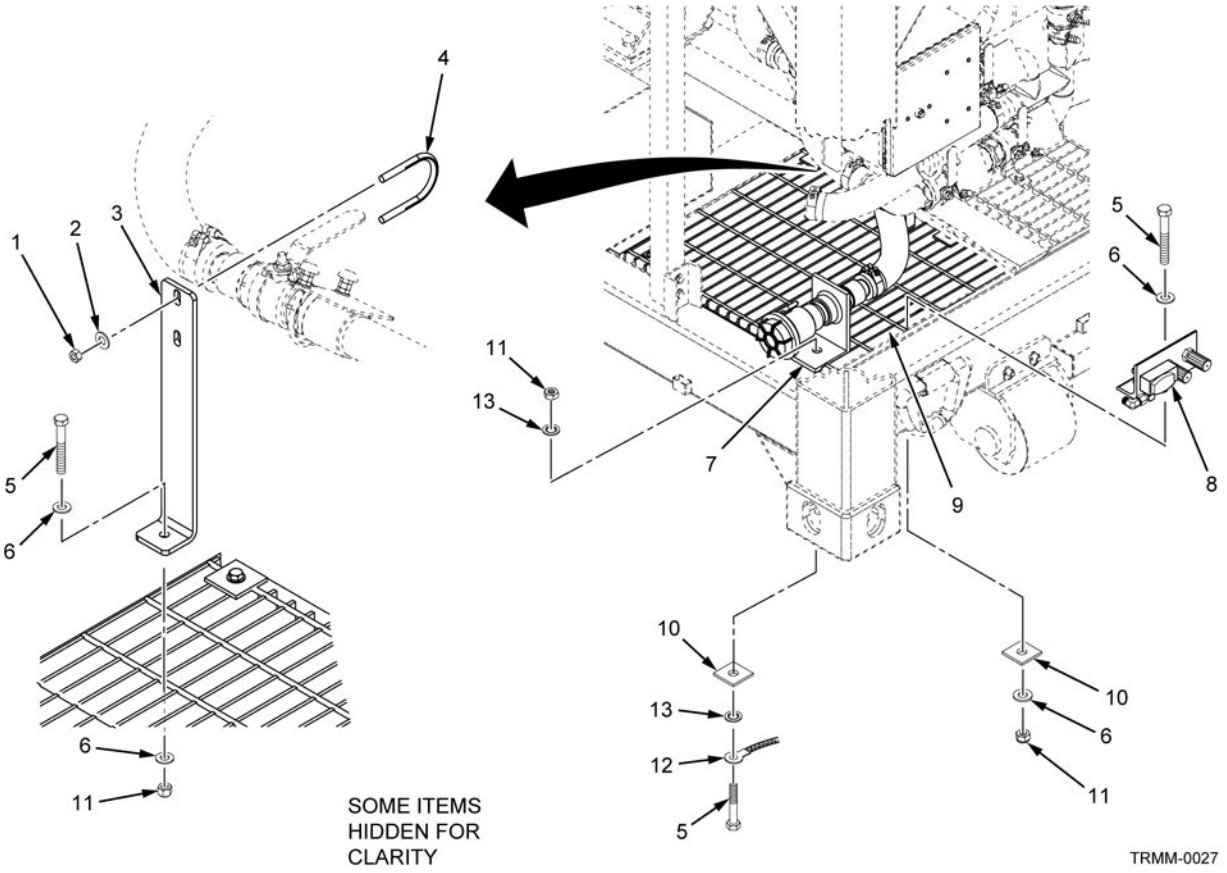


Figure 3. Installing Brackets.

END OF TASK

FOLLOW-ON MAINTENANCE

Install filter/separator assembly (WP 0133).

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
PUMP MOUNT GRATE REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool kit, general mechanic's (WP 0217, Table 1, Item 13)

Materials/Parts
Nut, self-locking, hexagon (LOCKNUTS) Qty: 6 (WP 0166, Figure 20, Item 6)
Nut, self-locking, hexagon (LOCKNUTS) Qty: 4 (WP 0167, Figure 21, Item 9)
Nut, self-locking, hexagon (LOCKNUTS) (WP 0177, Figure 31, Item 15)
Nut, self-locking, hexagon (LOCKNUTS) Qty: 4 (WP 0177, Figure 31, Item 17)
Nut, self-locking, hexagon (LOCKNUTS) Qty: 4 (WP 0188, Figure 42, Item 9)
Nut, self-locking, hexagon (LOCKNUTS) Qty: 4 (WP 0190, Figure 44, Item 9)
Nut, self-locking, hexagon (LOCKNUTS) Qty: 5 (WP 0190, Figure 44, Item 13)
Washer, lock internal tooth Qty: 4 (WP 0166, Figure 20, Item 4)
Pump Mount Grate (WP 0166, Figure 20, Item 7)

Personnel Required
91J Quartermaster and Chemical Equipment Repairer (2)

References
TM 10-4930-371-10

References (cont.)
WP 0079
WP 0080
WP 0089
WP 0096
WP 0103
WP 0143

Equipment Condition
MFS TRM grounded (TM 10-4930-371-10)
MFS TRM on ground (TM 10-4930-371-10)
MFS TRM drained (TM 10-4930-371-10)
Flow meter assembly removed (WP 0103)
Electric Motor assembly removed (WP 0079)
Ball valve placards removed (WP 0089)
Static reel removed (WP 0143)

Time to Complete
9 Hour(s)

REMOVAL

NOTE

Note orientation of hardware and components to aid in installation.

1. Loosen hose clamp (Figure 1, Item 2) and disconnect hose (Figure 1, Item 3).
2. Loosen hose clamp (Figure 1, Item 10) and disconnect hose (Figure 1, Item 1).
3. Loosen hose clamp (Figure 1, Item 8) and disconnect hose (Figure 1, Item 9).
4. Loosen hose clamp (Figure 1, Item 6) and disconnect hose (Figure 1, Item 7).
5. Loosen hose clamp (Figure 1, Item 5) and disconnect hose (Figure 1, Item 4).

REMOVAL - Continued

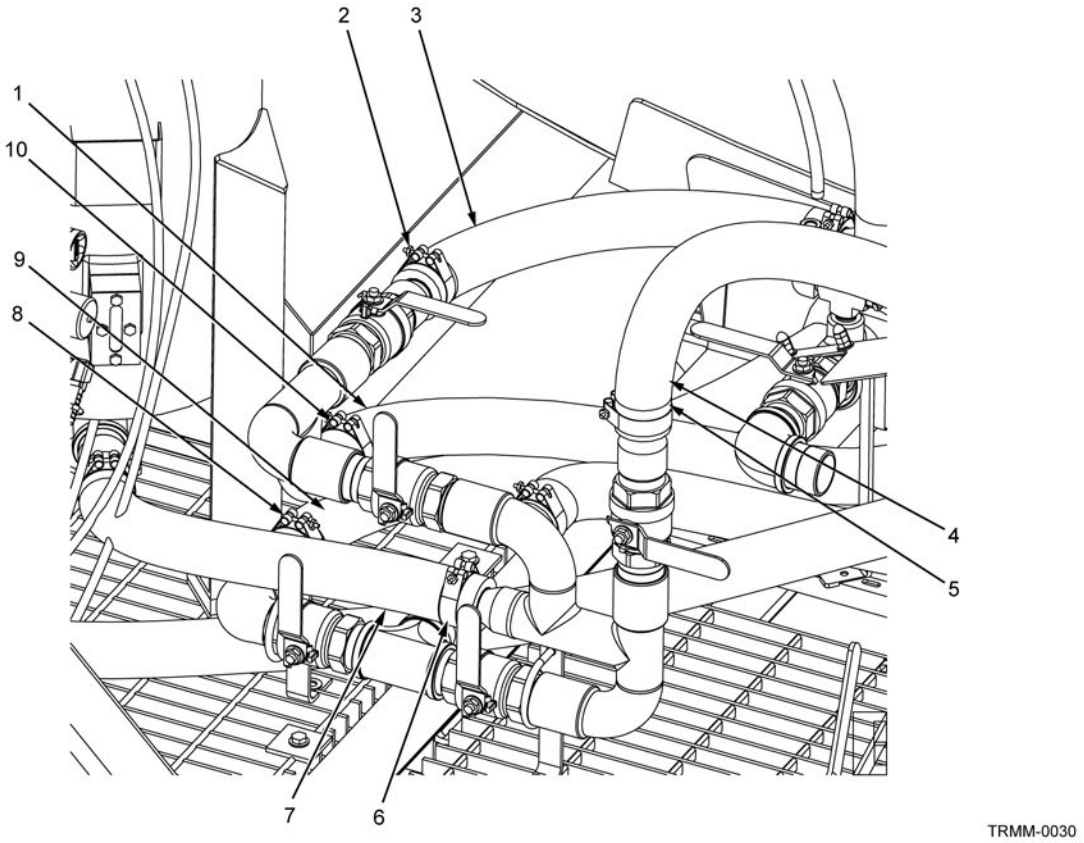


Figure 1. Disconnecting Ball Valve Hoses.

6. Remove two locknuts (Figure 2, Item 1), two flat washers (Figure 2, Item 2) and remove U-bolt (Figure 2, Item 4) from bracket (Figure 2, Item 3). Discard locknuts.
7. Remove two locknuts (Figure 2, Item 5), two flat washers (Figure 2, Item 6) and U-bolt (Figure 2, Item 8). from bracket (Figure 2, Item 7). Discard locknuts.
8. Remove entire ball valve manifold assembly (Figure 2, Item 9) from MFS TRM.

REMOVAL - Continued

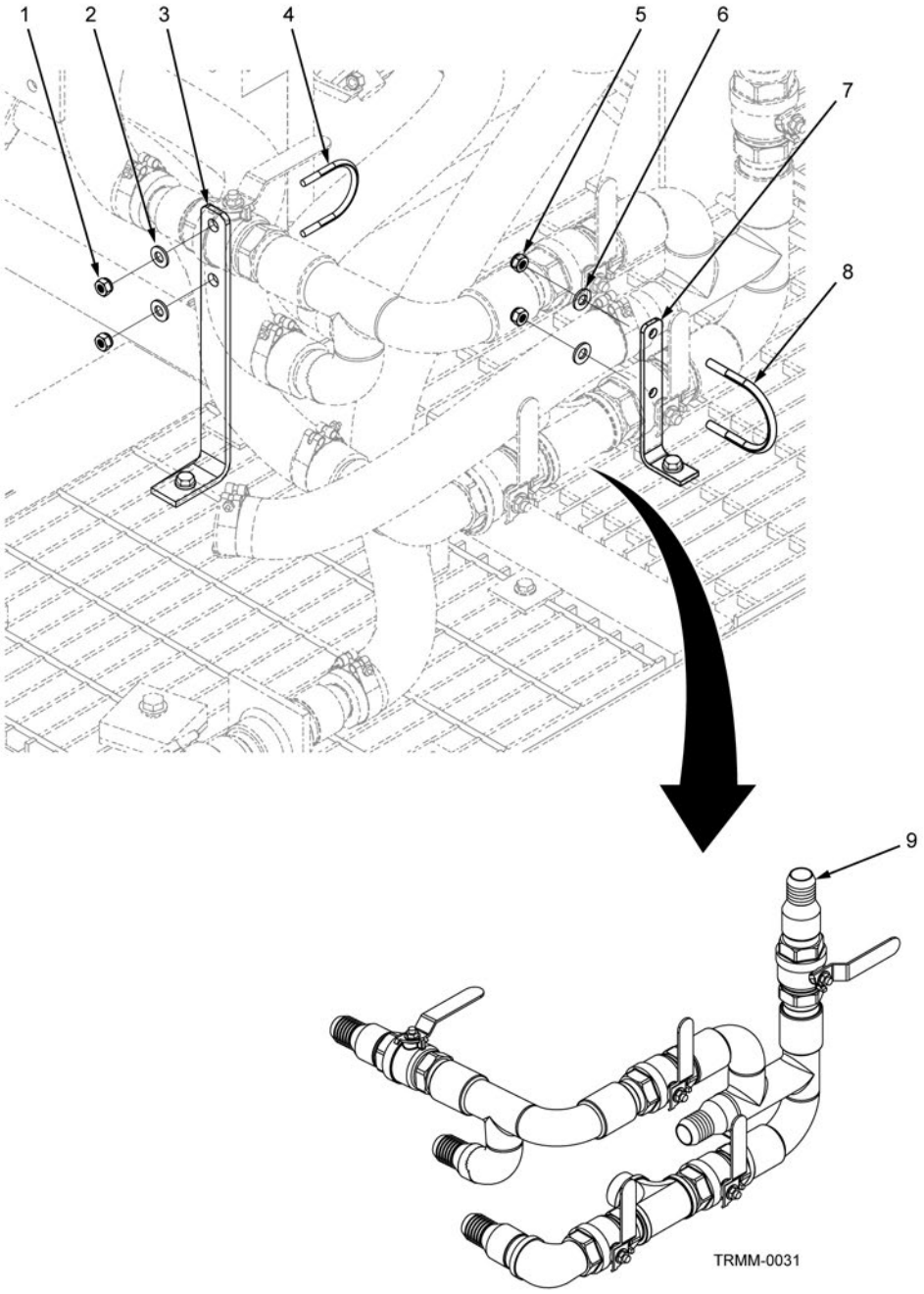


Figure 2. Detaching U-Bolts.

9. Remove four bolts (Figure 3, Item 18), eight flat washers (Figure 3, Items 9 and 17), two grating clasps (Figure 3, Item 8), and four locknuts (Figure 3, Item 10) and remove meter bracket (Figure 3, Item 1). Discard locknuts.

REMOVAL - Continued

10. Remove bolt (Figure 3, Item 16), flat washer (Figure 3, Item 15), grating clasp (Figure 3, Item 11), flat washer (Figure 3, Item 12), locknut (Figure 3, Item 13), and support bracket (Figure 3, Item 14). Discard locknut.

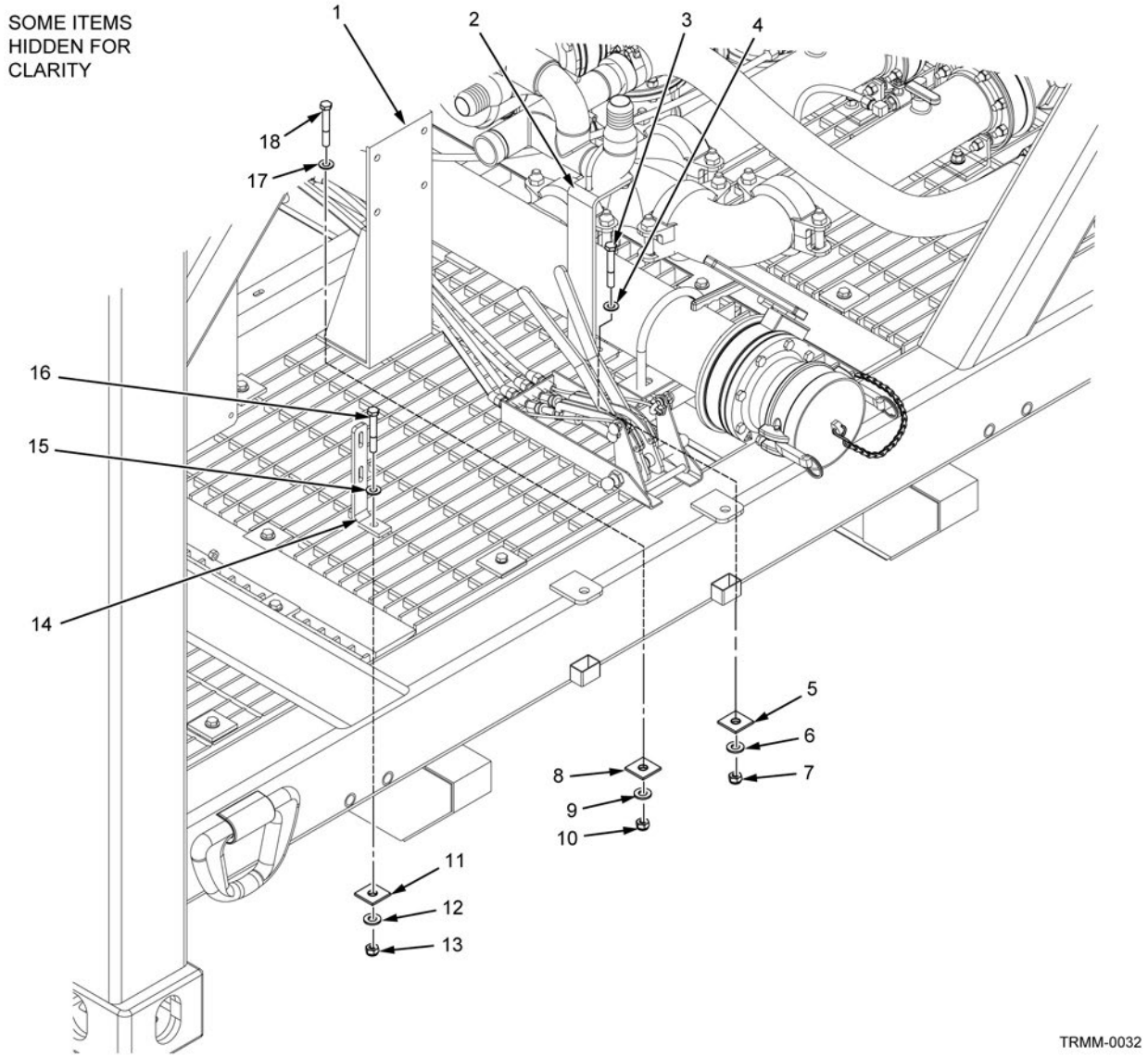


Figure 3. Removing Brackets.

11. Remove bolt (Figure 3, Item 3), flat washer (Figure 3, Item 4), grating clasp (Figure 3, Item 5), flat washer (Figure 3, Item 6), locknut (Figure 3, Item 7), from support bracket (Figure 3, Item 2). Discard locknut.

NOTE

It is not necessary to completely remove the valve control lever assembly
.

REMOVAL - Continued

12. Remove four bolts (Figure 4, Item 2), four flat washers (Figure 4, Item 1), four locknuts (Figure 4, Item 11), four flat washers (Figure 4, Item 10), and four grating clasps (Figure 4, Item 9) securing valve control lever assembly (Figure 4, Item 12). Discard locknuts.
13. Remove two locknuts (Figure 4, Item 7), two flat washers (Figure 4, Item 6), and U-bolt (Figure 4, Item 5) from bracket (Figure 4, Item 8).
14. Remove two locknuts (Figure 4, Item 11), two flat washers (Figure 4, Item 10), two grating clasps (Figure 4, Item 9), two flat washers (Figure 4, Item 3) and two bolts (Figure 4, Item 4) and remove bracket (Figure 4, Item 8).

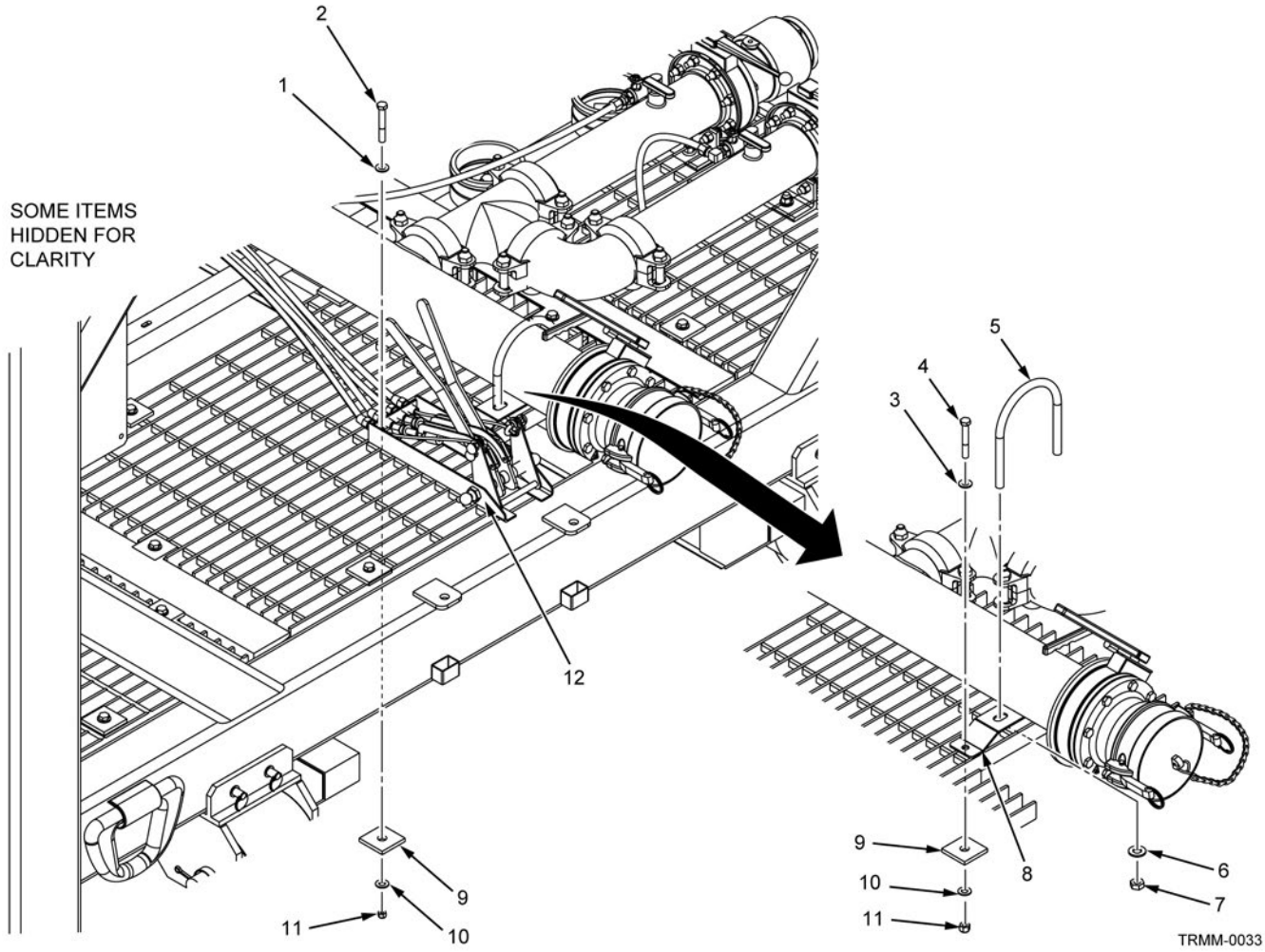


Figure 4. Removing Hardware.

15. Remove four locknuts (Figure 5, Item 8), four flat washers (Figure 5, Item 2), four grating clasps (Figure 5, Item 3), four bolts (Figure 5, Item 1), and four flat washers (Figure 5, Item 2).
16. Remove two locknuts (Figure 5, Items 7 and 8), four internal lock washers (Figure 5, Item 4), two grating clasps (Figure 5, Item 3), two bolts (Figure 5, Item 1), and ground straps (Figure 5, Item 6 and 9).

REMOVAL - Continued

NOTE

Support control lever assembly prior to removing deck grate.

17. Slightly lift main piping assembly (Figure 5, Item 8) and valve control lever assembly (Figure 5, Item 10) and remove pump deck grate (Figure 5, Item 5) from MFS TRM.

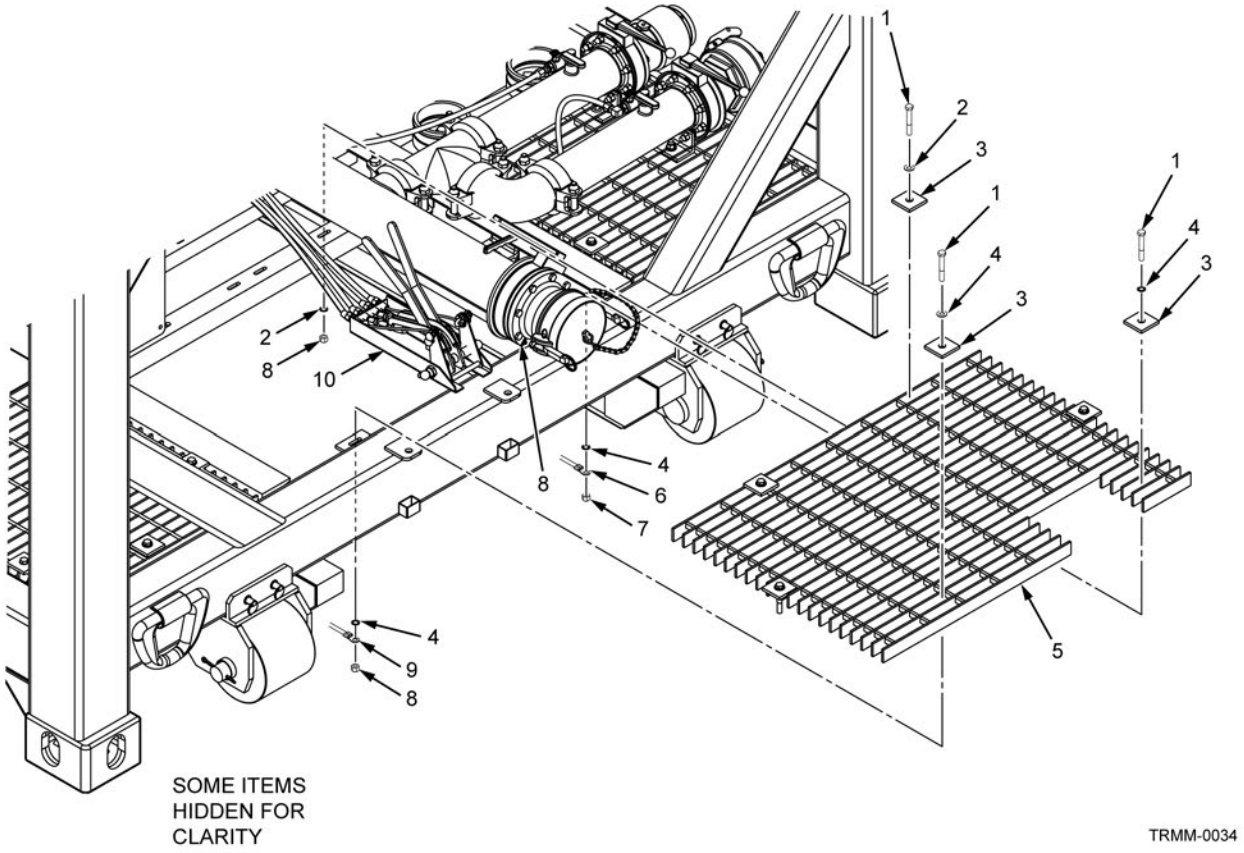


Figure 5. Pump Deck Grate.

END OF TASK

INSTALLATION

1. Slightly lift main piping assembly (Figure 5, Item 8) and valve control lever assembly (Figure 5, Item 10) and install pump deck grate (Figure 5, Item 5) in MFS TRM.
2. Install four bolts (Figure 5, Item 1), four flat washers (Figure 5, Item 2), four grating clasps (Figure 5, Item 3), four flat washers (Figure 5, Item 2) and four locknuts (Figure 5, Item 8).
3. Install two bolts (Figure 5, Item 1), four internal lock washers (Figure 5, Item 4), two grating clasps (Figure 5, Item 3), ground straps (Figure 5, Items 6 and 9), and two new locknuts (Figure 5, Items 7 and 8).
4. Install four bolts (Figure 6, Item 2), four flat washers (Figure 6, Item 1), four new locknuts (Figure 6, Item 11), four flat washers (Figure 6, Item 10), and four grating clasps (Figure 6, Item 9) securing valve control lever assembly (Figure 6, Item 12).

INSTALLATION - Continued

5. Loosely install bracket (Figure 6, Item 8), with two bolts (Figure 6, Item 4), four flat washers (Figure 6, Items 3 and 10), two grating clasps (Figure 6, Item 9), two new locknuts (Figure 6, Item 11).
6. Install U-bolt (Figure 6, Item 5) and secure with two new locknuts (Figure 6, Item 7), and two flat washers (Figure 6, Item 6).
7. Tighten two bolts (Figure 6, Item 4).

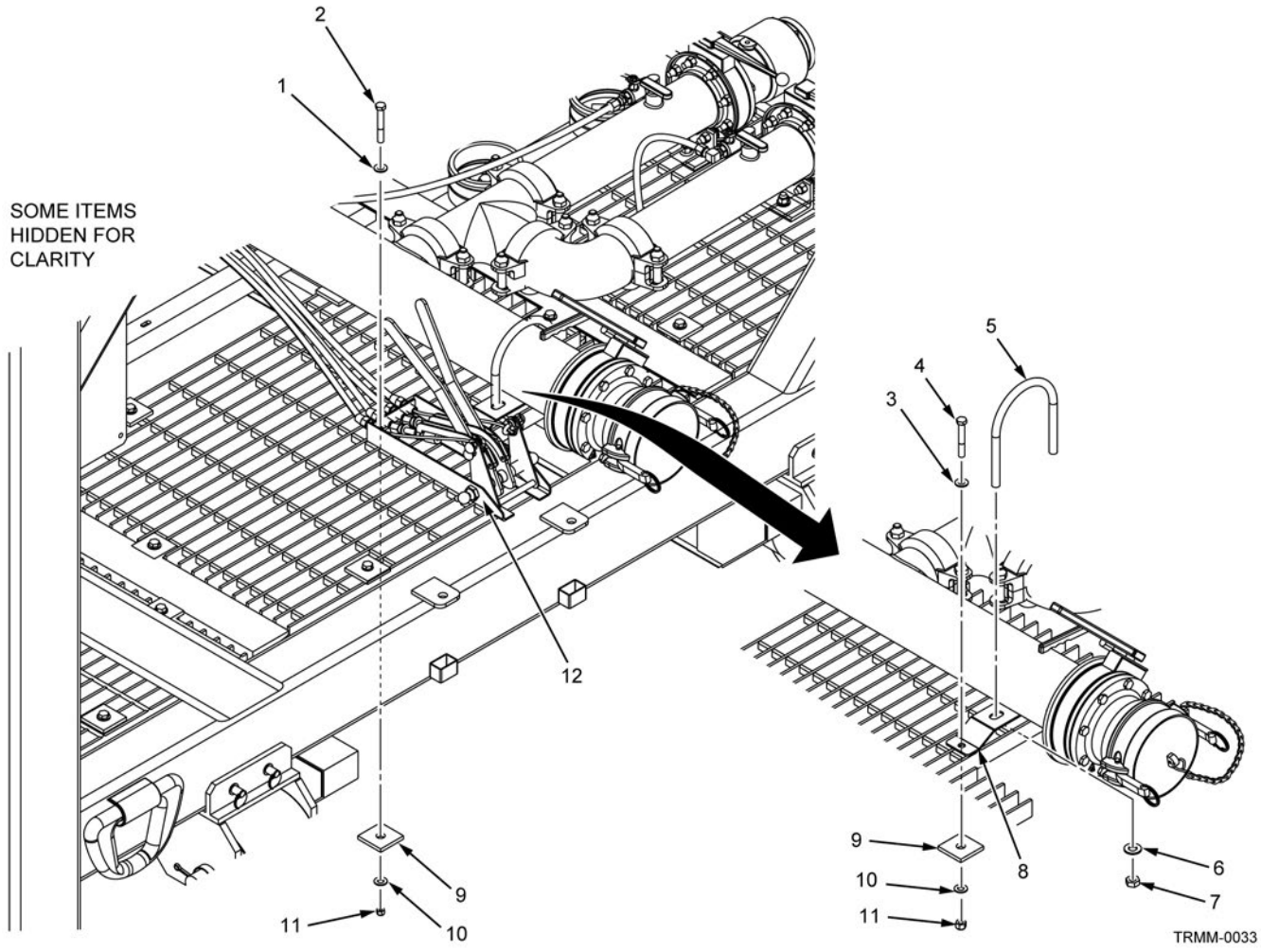


Figure 6. Installing Hardware.

8. Install bolt (Figure 7, Item 3), flat washer (Figure 7, Item 4), new locknut (Figure 7, Item 7), flat washer (Figure 7, Item 6) and grating clasp (Figure 7, Item 5) to secure support bracket (Figure 7, Item 2).
9. Install meter bracket (Figure 7, Item 1) and secure with four bolts (Figure 7, Item 18), eight flat washers (Figure 7, Items 17 and 9), two grating clasps (Figure 7, Item 8), and four new locknuts (Figure 7, Item 10).

INSTALLATION - Continued

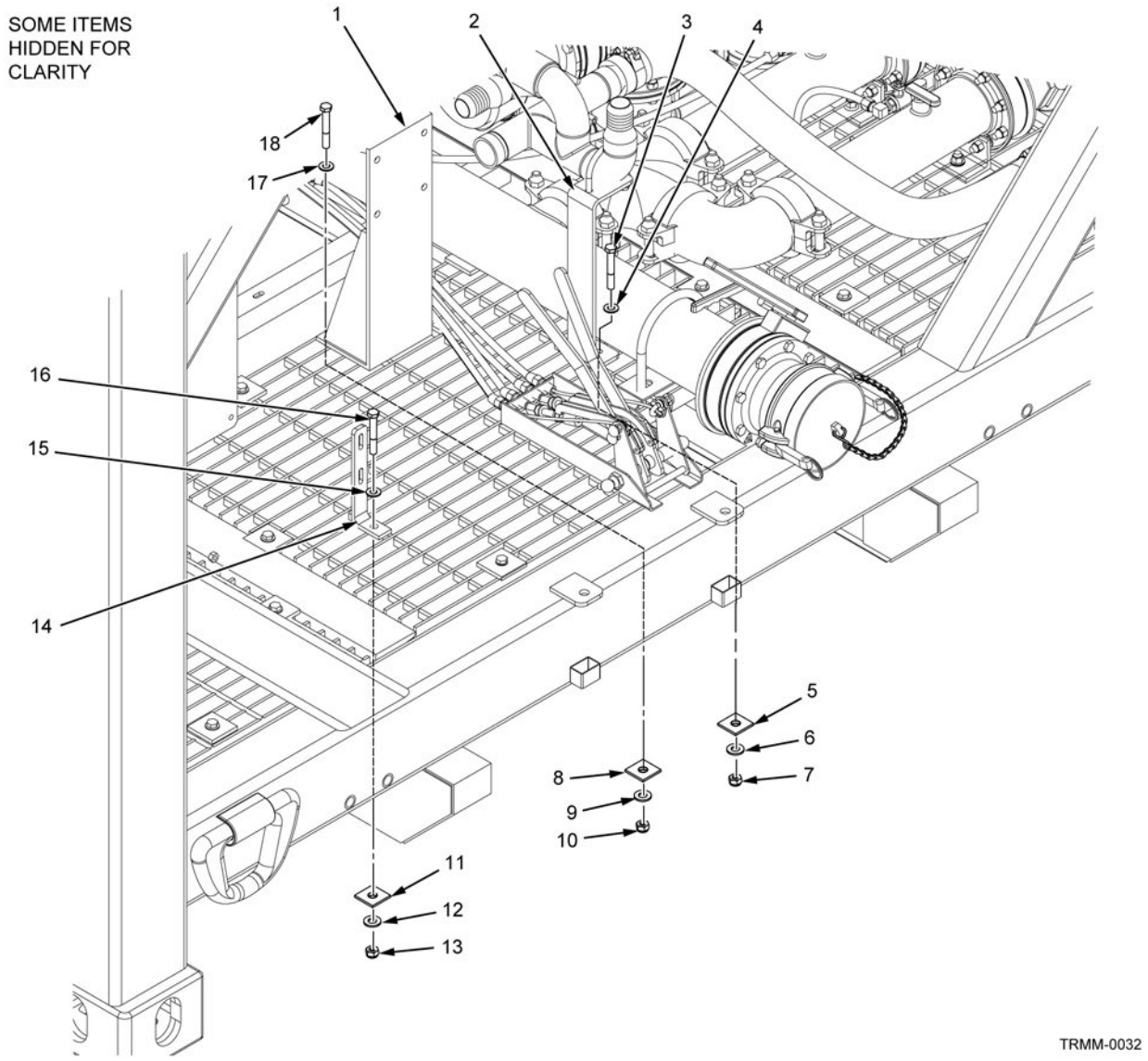


Figure 7. Installing Brackets.

10. Install support bracket (Figure 7, Item 14) and secure with bolt (Figure 7, Item 16), flat washer (Figure 7, Item 15), new locknut (Figure 7, Item 13), flat washer (Figure 7, Item 12), and grating clasp (Figure 7, Item 11).
11. Install ball valve manifold assembly (Figure 8, Item 9) in MFS TRM.
12. Loosely install U-bolt (Figure 8, Item 4) from bracket (Figure 8, Item 3) and secure with two new locknuts (Figure 8, Item 1) and two flat washers (Figure 8, Item 2).
13. Loosely install U-bolt (Figure 8, Item 8) on bracket (Figure 8, Item 7) and secure with two new locknuts (Figure 8, Item 5), and two flat washers (Figure 8, Item 6).
14. Tighten new locknuts (Figure 8, Items 1 and 5).

INSTALLATION - Continued

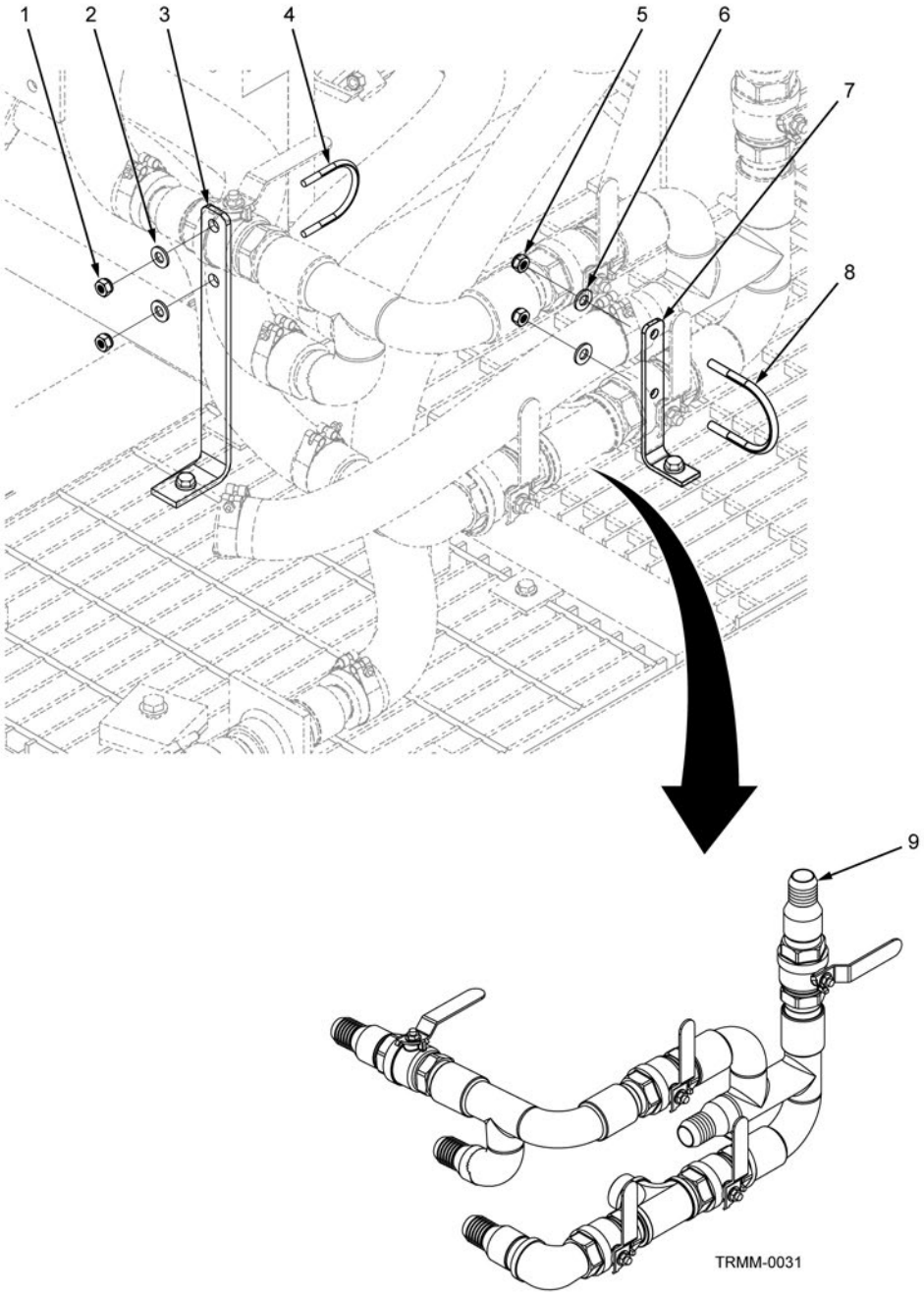


Figure 8. Attaching U-Bolts.

15. Connect hose (Figure 9, Item 3) and tighten hose clamp (Figure 9, Item 2).
16. Connect hose (Figure 9, Item 1) and tighten hose clamp (Figure 9, Item 10).
17. Connect hose (Figure 9, Item 9) and tighten hose clamp (Figure 9, Item 8).
18. Connect hose (Figure 9, Item 7) and tighten hose clamp (Figure 9, Item 6).

INSTALLATION - Continued

19. Connect hose (Figure 9, Item 4) and tighten hose clamp (Figure 9, Item 5).

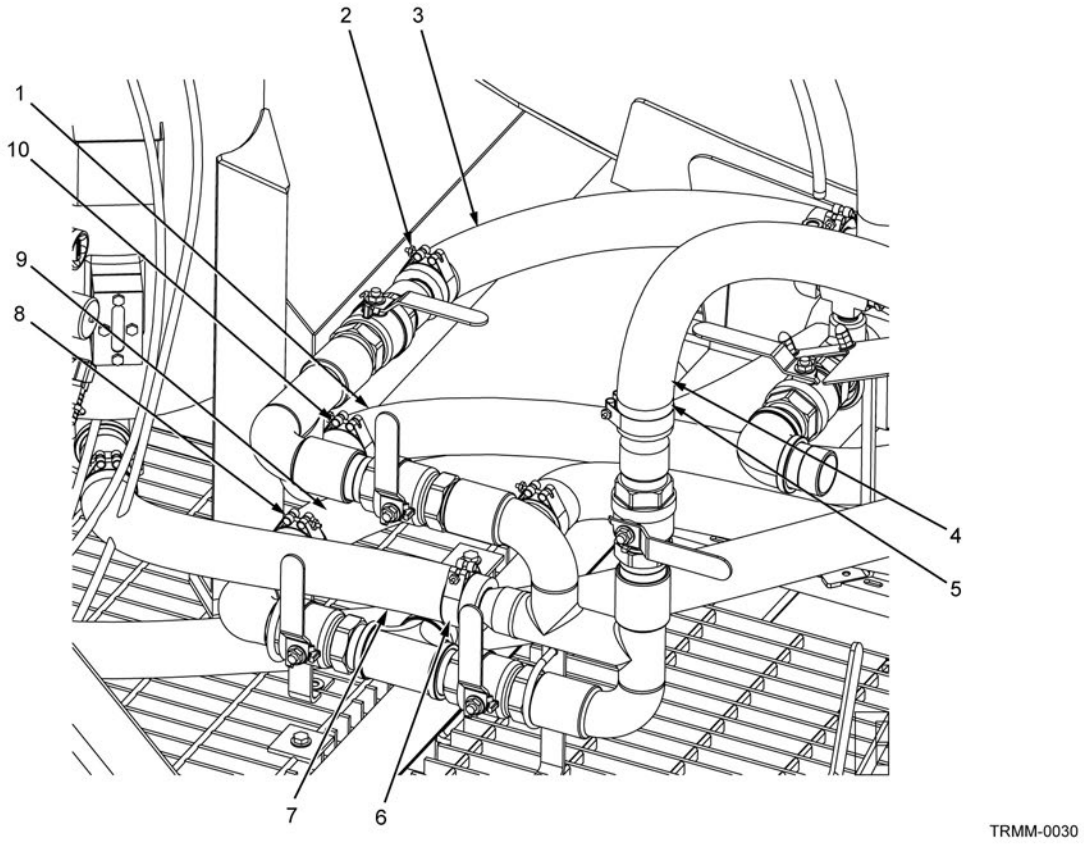


Figure 9. Connecting Ball Valve Hoses.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install electric motor assembly (WP 0079).
2. Install pump assembly (WP 0080).
3. Install flow meter assembly (WP 0103).
4. Install right side piping manifold assembly (WP 0096).
5. Install static reels (WP 0143).
6. Install ball valve placards (WP 0089).
7. Set up MFS TRM (TM 10-4930-371-10).

FOLLOW-ON MAINTENANCE - Continued

8. Check MFS TRM for leaks by recirculating fuel (TM 10-4930-371-10).

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
CONTROL CABLE ADJUSTMENTS

INITIAL SETUP:

Tools and Special Tools
Tool kit, general mechanic's (WP 0217, Table 1, Item 13)

Equipment Condition
MFS TRM grounded (TM 10-4930-371-10)
MFS TRM shut down (TM 10-4930-371-10)

Personnel Required
91J Quartermaster and Chemical Equipment Repairer

Time to Complete
0.5 Hour(s)

EMERGENCY LEVER CABLE ADJUSTMENT

1. Remove vapor recovery line dust cap (Figure 1, Item 2).
2. Momentarily open then close bottom loading valve (V1) (Figure 1, Item 1) to vent tank pressure.

EMERGENCY LEVER CABLE ADJUSTMENT - Continued

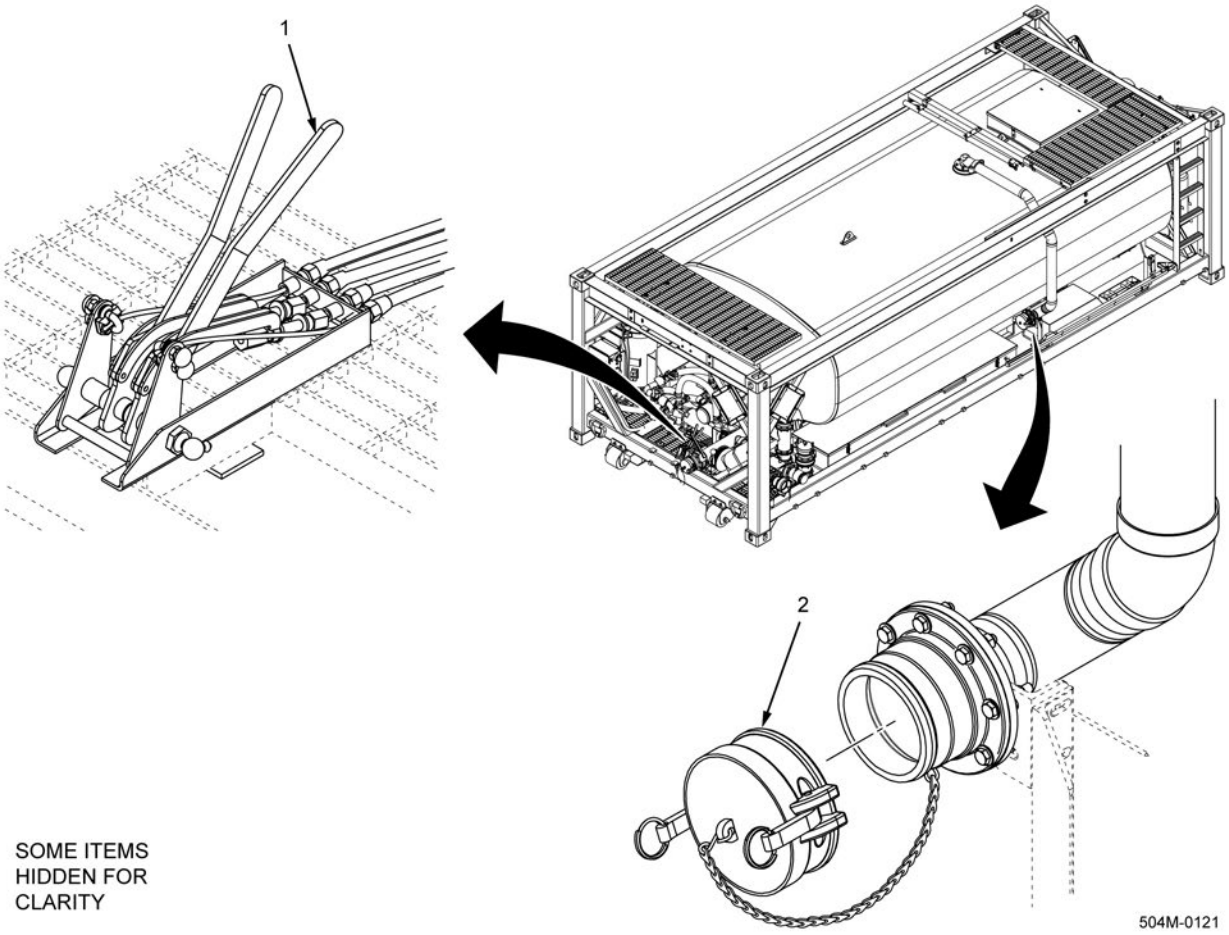


Figure 1. Fuel System Venting.

3. At control lever assembly, remove two cap nuts (Figure 2, Item 1).
4. Loosen two nuts (Figure 2, Item 2) to loosen U-bolt (Figure 2, Item 4) and cable (Figure 2, Item 3).
5. Pull cable (Figure 2, Item 3) through U-bolt (Figure 2, Item 4) until there is no slack, then secure cable (Figure 2, Item 3) in U-bolt (Figure 2, Item 4) by tightening two nuts (Figure 2, Item 2).
6. Install two cap nuts (Figure 2, Item 1).

EMERGENCY LEVER CABLE ADJUSTMENT - Continued

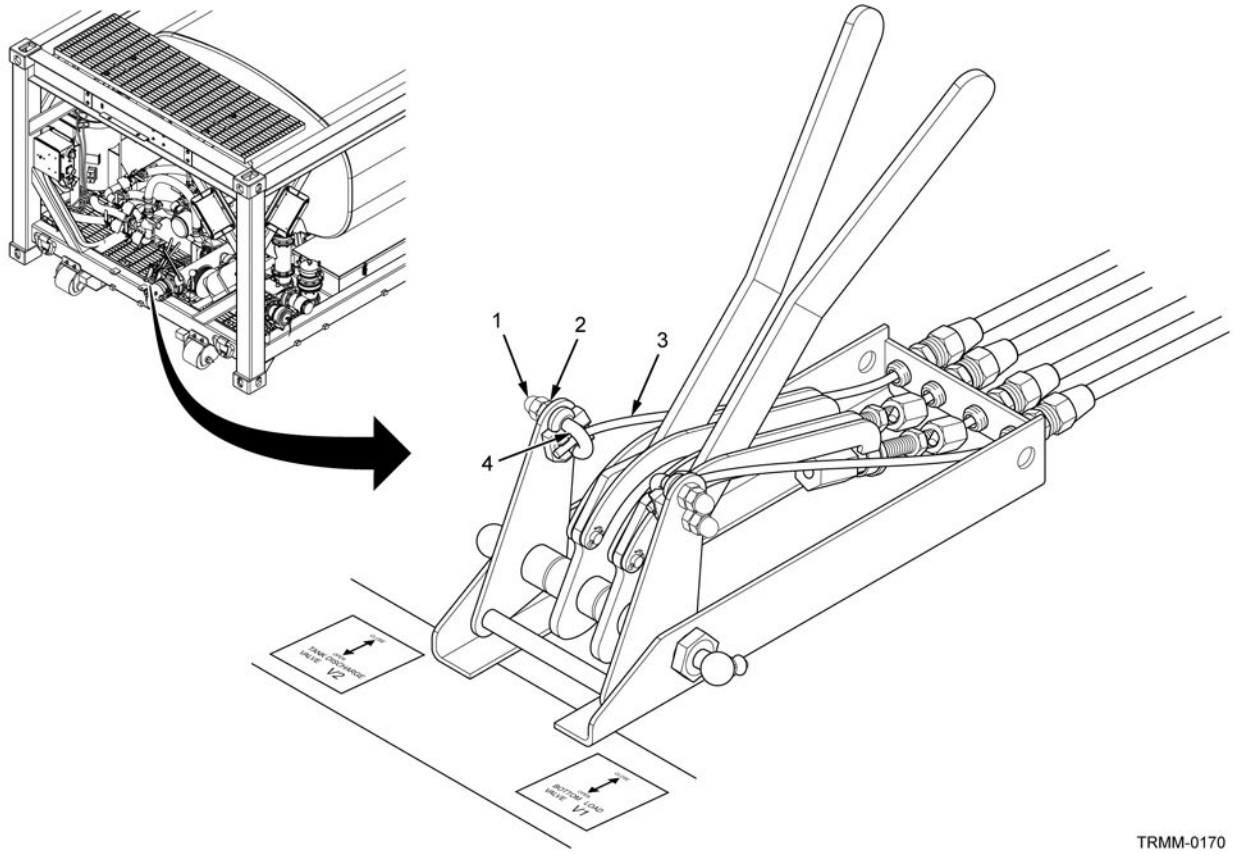


Figure 2. Adjusting Emergency Lever Cable.

END OF TASK

EMERGENCY LEVERS TEST

Inspect emergency shutoff levers for proper operation:

a. Open bottom loading valve (V1).

b. Open tank discharge valve (V2).

c. Pull emergency shutoff lever to verify operation.

d. Repeat steps a through c for other emergency shutoff lever.

e. Open tank discharge valve (V2), and then reclose it to reset.

END OF TASK

BOTTOM LOADING VALVE (V1) OR TANK DISCHARGE VALVE (V2) CABLE ADJUSTMENT

1. Loosen clamping nut (Figure 3, Item 1).
2. Pull cable (Figure 3, Item 2) through clamping nut (Figure 3, Item 1) until there is no slack, then tighten clamping nut (Figure 3, Item 1).

BOTTOM LOADING VALVE (V1) OR TANK DISCHARGE VALVE (V2) CABLE ADJUSTMENT - Continued

3. Complete emergency lever test in this WP.

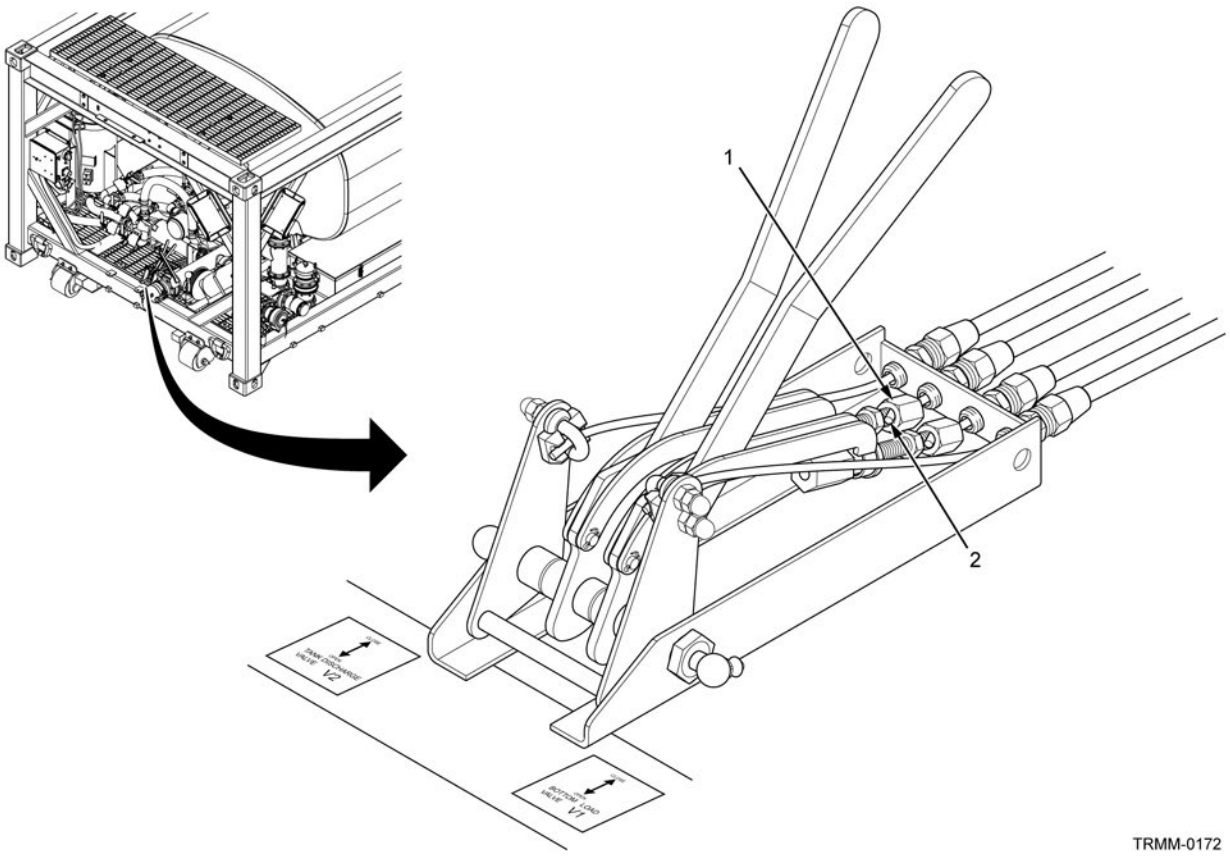


Figure 3. Adjusting (V1) or (V2) Lever Cable.

4. Install dust cap (Figure 4, Item 1) on vapor recovery line.

BOTTOM LOADING VALVE (V1) OR TANK DISCHARGE VALVE (V2) CABLE ADJUSTMENT - Continued

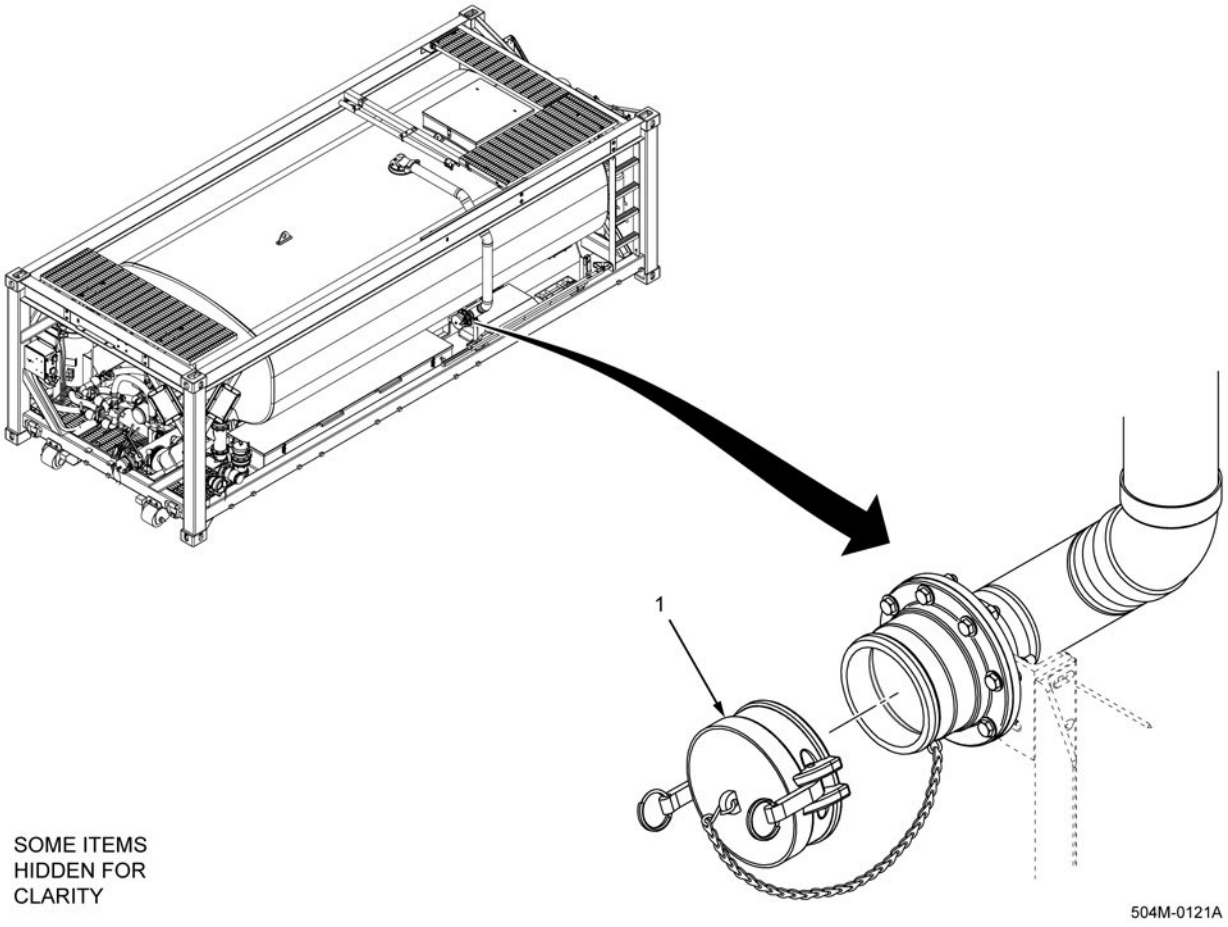


Figure 4. Installing Vapor Recovery Line Dust Cap.

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
CONTROL LEVER ASSEMBLY (V1/V2) REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool kit, general mechanic's (WP 0217, Table 1, Item 13)

Materials/Parts
Nut, self-locking, hexagon (LOCKNUTS) Qty: 4 (WP 0167, Figure 21, Item 9)
Control Lever Assembly (V1/V2) (WP 0167, Figure 21, Item 1)

Personnel Required
91J Quartermaster and Chemical Equipment Repairer (2)

References
TM 10-4930-371-10
WP 0073

Equipment Condition
MFS TRM grounded (TM 10-4930-371-10)
MFS TRM shut down (TM 10-4930-371-10)

Time to Complete
2.0 Hour(s)

REMOVAL

1. Remove vapor recovery line dust cap (Figure 1, Item 2).
2. Momentarily open then close bottom loading valve (V1) (Figure 1, Item 1) to vent tank pressure.

REMOVAL - Continued

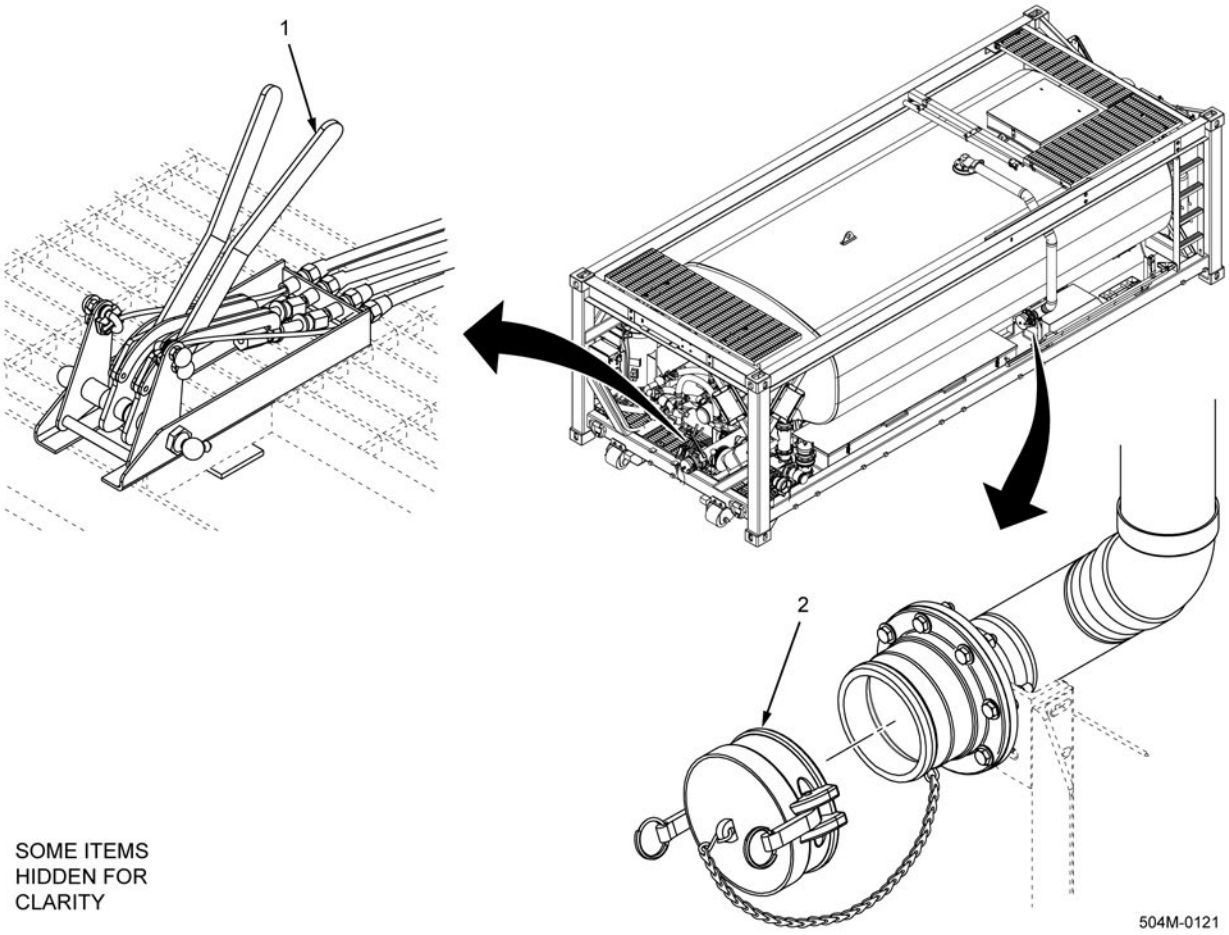


Figure 1. Fuel System Venting.

3. Remove four cap nuts (Figure 2, Item 1).
4. Remove four nuts (Figure 2, Item 2) to loosen two U-bolts (Figure 2, Item 5) and release emergency tank discharge valve (V2) (Figure 2, Item 3) and emergency bottom load valve (V1) cables (Figure 2, Item 4).

REMOVAL - Continued

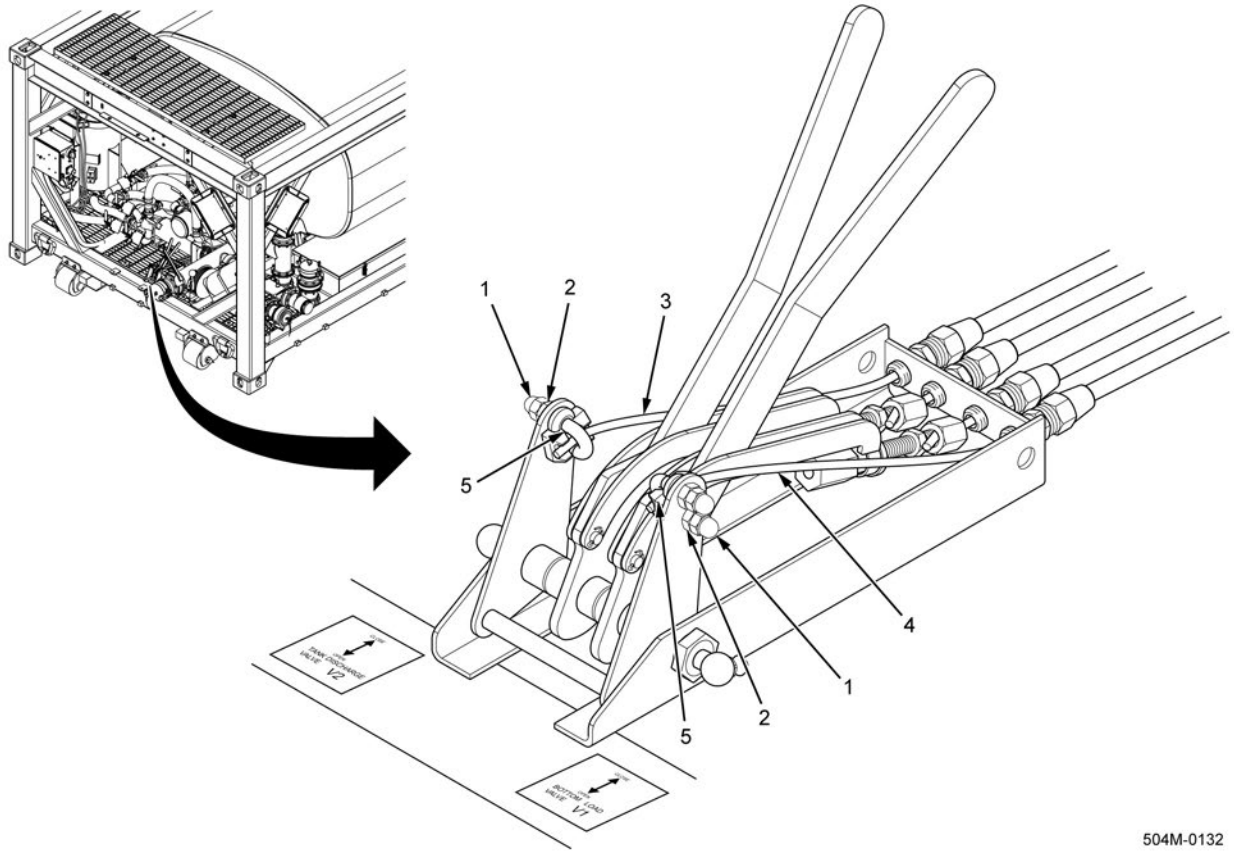


Figure 2. Disconnecting Tank Discharge Valve (V2) and Bottom Loading Valve (V1) Lever Cables.

5. Remove two clamping nuts (Figure 3, Item 2) to release tank discharge valve (V2) control cable (Figure 3, Item 1) and bottom loading valve (V1) control cable (Figure 3, Item 5).
6. Unscrew four tube nuts (Figure 3, Item 4) from four copper fittings (Figure 3, Item 3).

REMOVAL - Continued

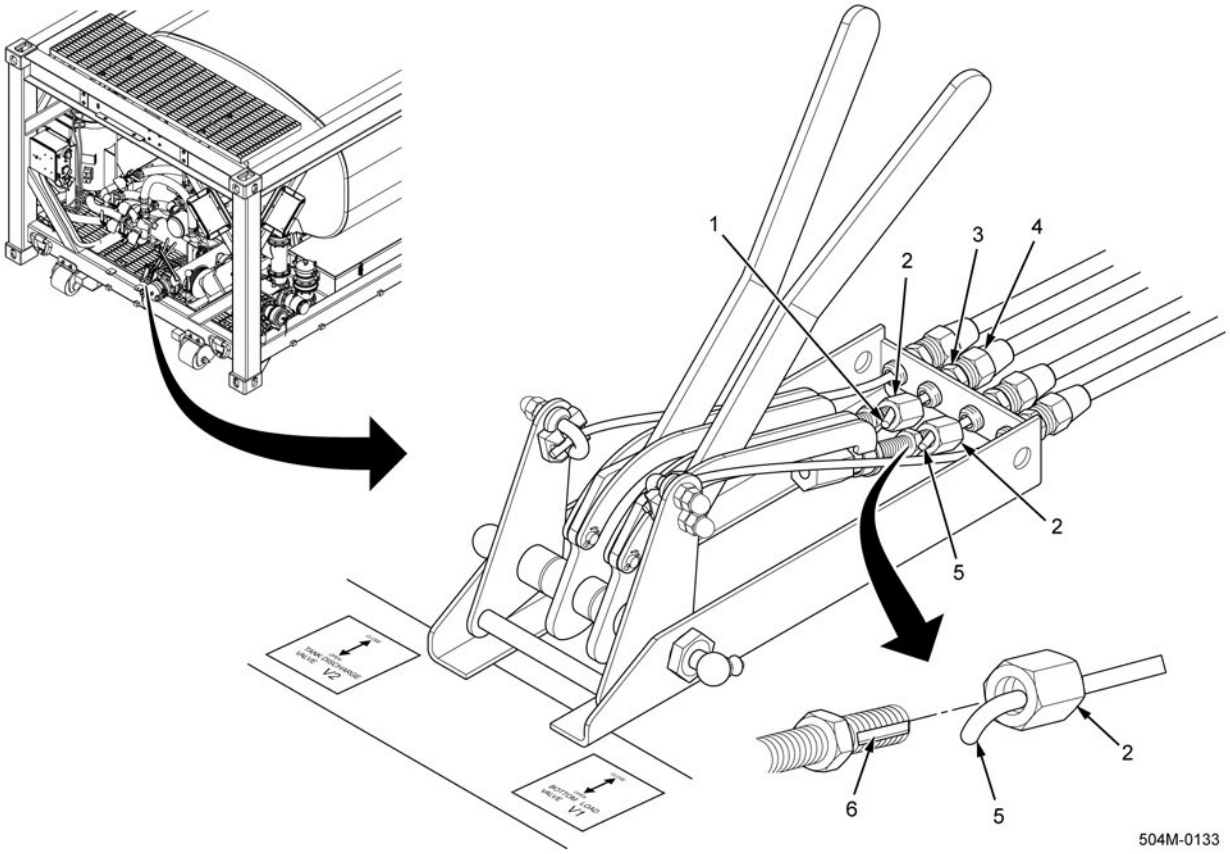


Figure 3. Disconnecting Valve Cables.

7. Remove four locknuts (Figure 4, Item 5), four flat washers (Figure 4, Item 4), and four grate clasps (Figure 4, Item 3). Discard locknuts.
8. Remove four bolts (Figure 4, Item 1) and four flat washers (Figure 4, Item 7) and remove lever assembly (Figure 4, Item 6) from grate (Figure 4, Item 2).

REMOVAL - Continued

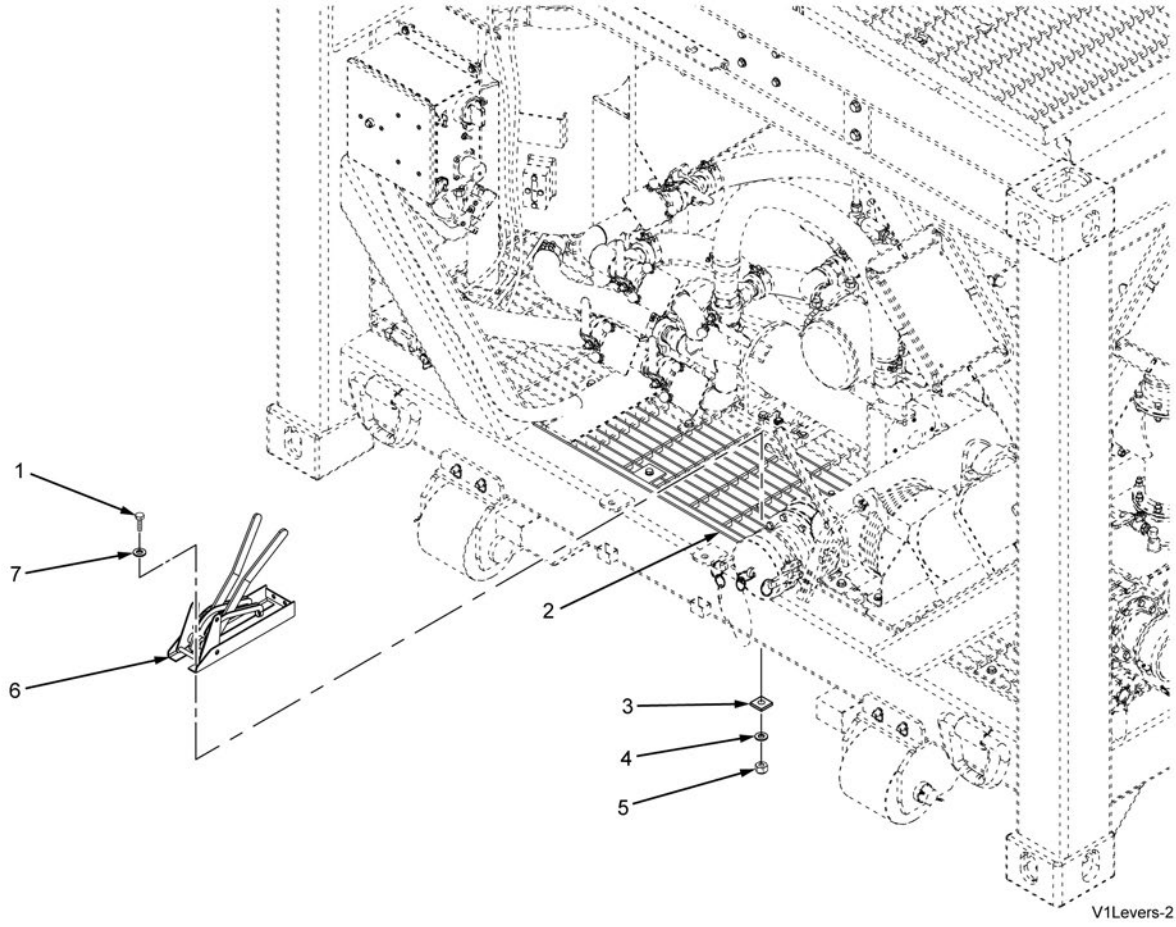


Figure 4. Removing Lever Assembly.

END OF TASK

INSTALLATION

1. Position lever assembly (Figure 4, Item 6) on grate (Figure 4, Item 2).
2. Feed cables (Figure 5, Items 1 and 5) and (Figure 6, Items 3 and 4) through copper fittings (Figure 5, Item 3).
3. Tighten tube nuts (Figure 5, Item 4) on all four cables.
4. Install four bolts (Figure 4, Item 1), grate clasps (Figure 4, Item 3), eight flat washers (Figure 4, Items 4 and 7) and four new locknuts (Figure 4, Item 5) to secure lever assembly (Figure 4, Item 6) to grate (Figure 4, Item 2).
5. Feed cables (Figure 5, Items 1 and 5) through middle clamping nuts (Figure 5, Item 2).
6. Lay cable (Figure 5, Item 5) in slot (Figure 5, Item 6) of adjustment rod and pull cable hand tight, then tighten middle clamping nuts (Figure 5, Item 2). Repeat for other cable (Figure 5, Item 1).

INSTALLATION - Continued

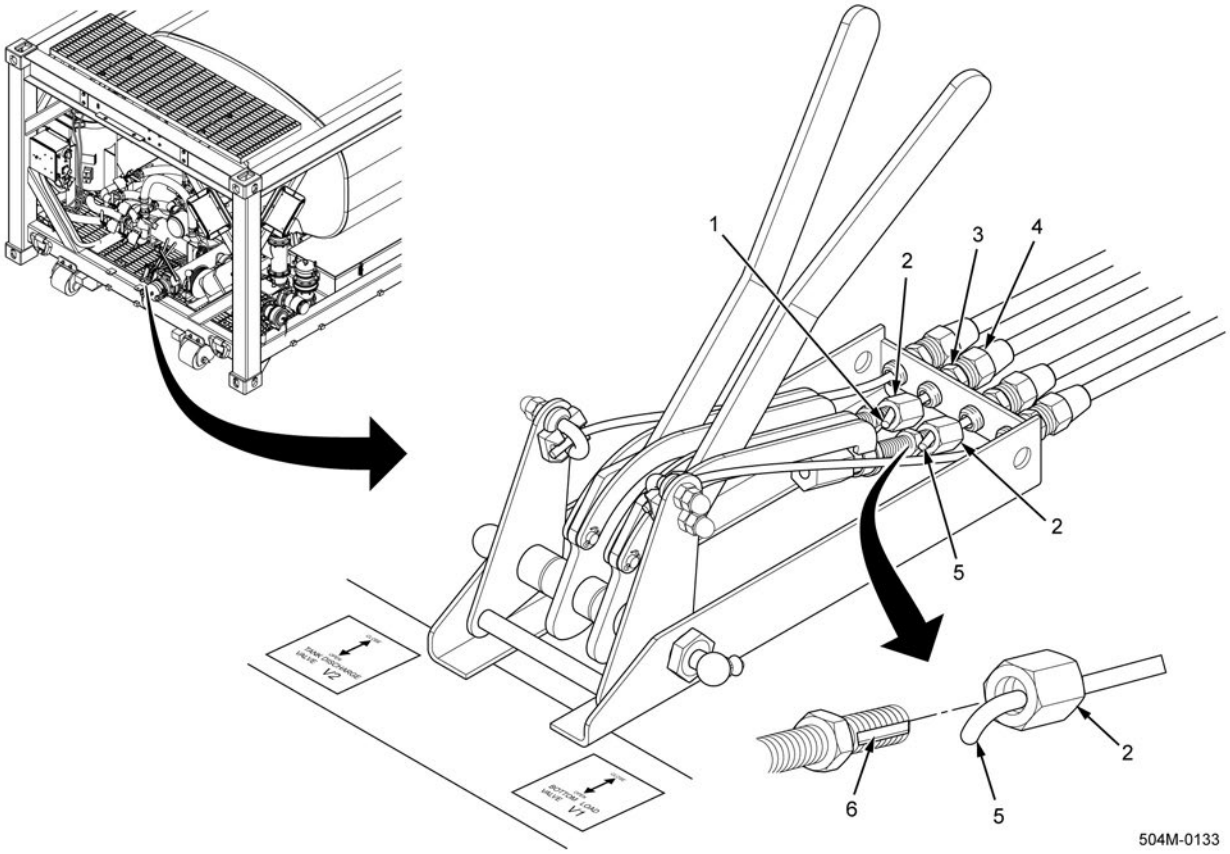


Figure 5. Connecting Valve Cables.

7. Open bottom loading valve (V1) and tank discharge valve (V2) levers.
8. Install cables (Figure 6, Items 3 and 4) through U-bolts (Figure 6, Item 5).
9. Pull cables (Figure 6, Items 3 and 4) tight and tighten four nuts (Figure 6, Item 2).
10. Install four cap nuts (Figure 6, Item 1).

INSTALLATION - Continued

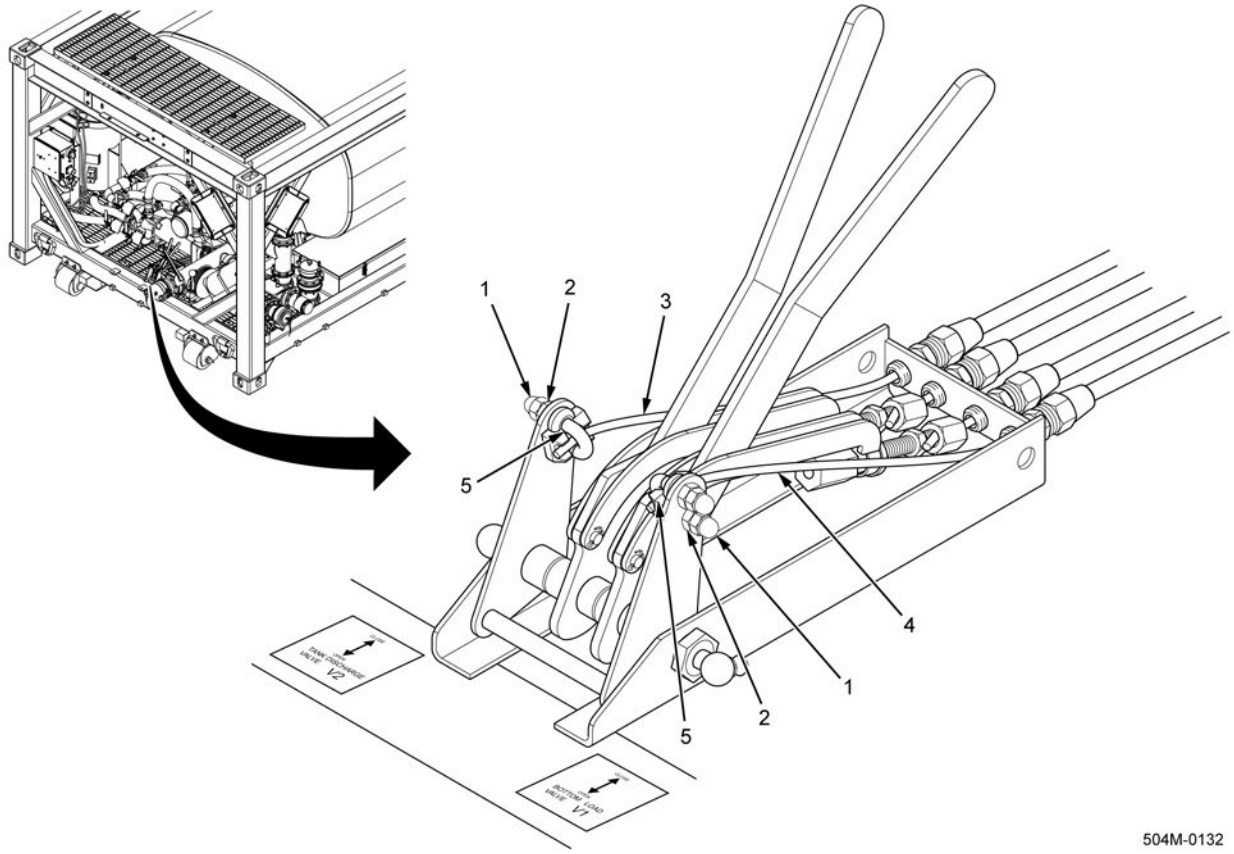


Figure 6. Connecting Emergency Lever Cable.

11. Complete a control cable adjustment.
12. Complete a test for emergency levers (WP 0073).
13. Install dust cap (Figure 7, Item 1) on vapor recovery line.

INSTALLATION - Continued

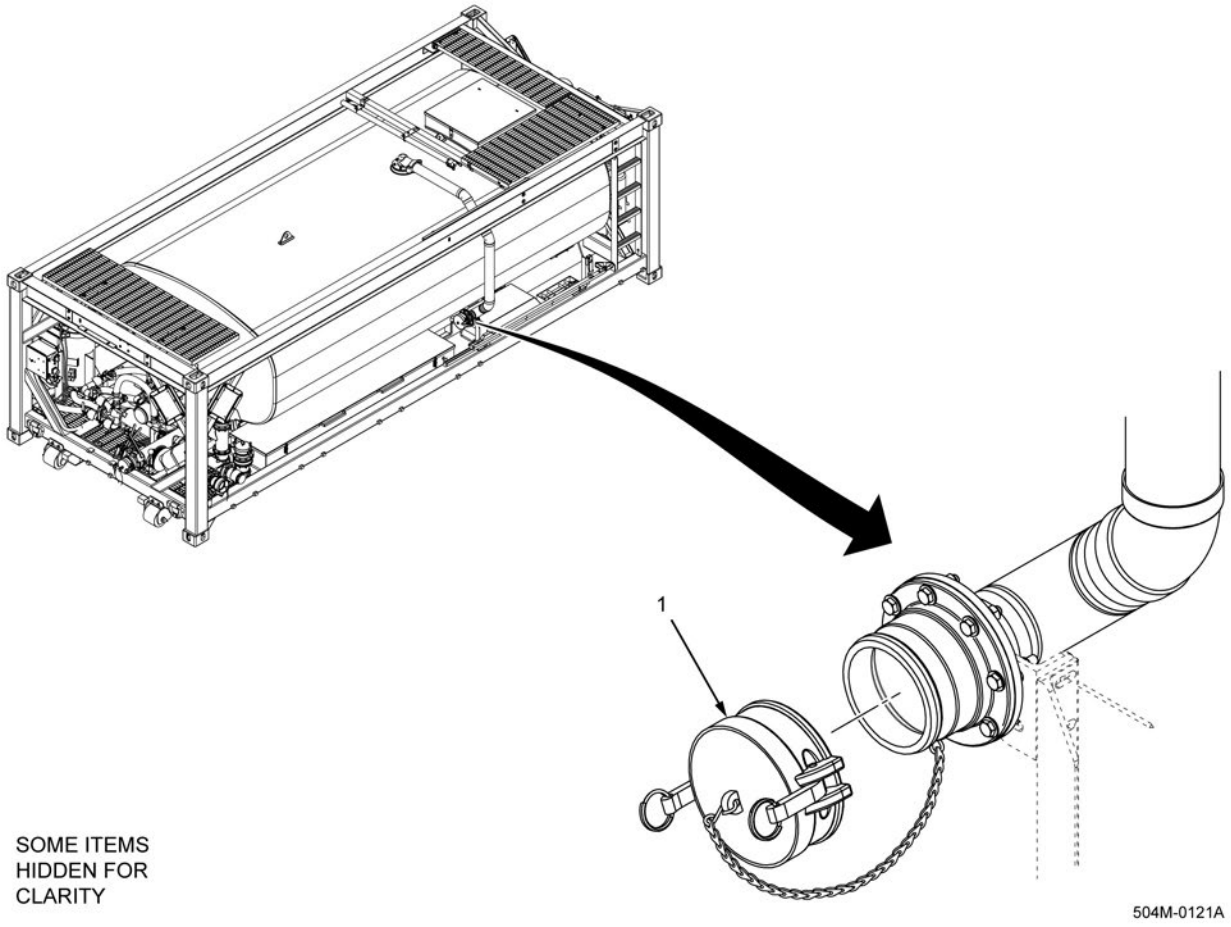


Figure 7. Install Dust Cap.

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
CONTROL CABLES REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Gloves, disposable nitrile (WP 0216, Table 1, Item 5)

Materials/Parts
- Petrolatum, technical (WP 0216, Table 1, Item 10)
- Actuator Cable, Emergency, Left (WP 0168, Figure 22, Item 1)
- Actuator Cable, Emergency, Right (WP 0168, Figure 22, Item 2)
- Actuator Cable, V1 (WP 0168, Figure 22, Item 3)
- Actuator Cable, V2 (WP 0168, Figure 22, Item 4)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer (2)

References
- TM 10-4930-371-10
- WP 0073

Equipment Condition
- MFS TRM shut down (TM 10-4930-371-10)
- MFS TRM grounded (TM 10-4930-371-10)
- MFS TRM loaded on PLS trailer (TM 10-4930-371-10)
- MFS TRM ladder platform emplaced (TM 10-4930-371-10)
- MFS TRM ladder emplaced (TM 10-4930-371-10)

Time to Complete
- 1 Hour(s)

EMERGENCY LEVER CABLE REPLACEMENT - REMOVAL

NOTE

The control cable assemblies consist of a braided steel cable inside a copper or steel tube. Either the braided steel cable or the tubing can be replaced independently without replacing the other.

1. Remove vapor recovery line dust cap (Figure 1, Item 2).
2. Momentarily open then close bottom loading valve (V1) (Figure 1, Item 1) to vent tank pressure.

EMERGENCY LEVER CABLE REPLACEMENT - REMOVAL - Continued

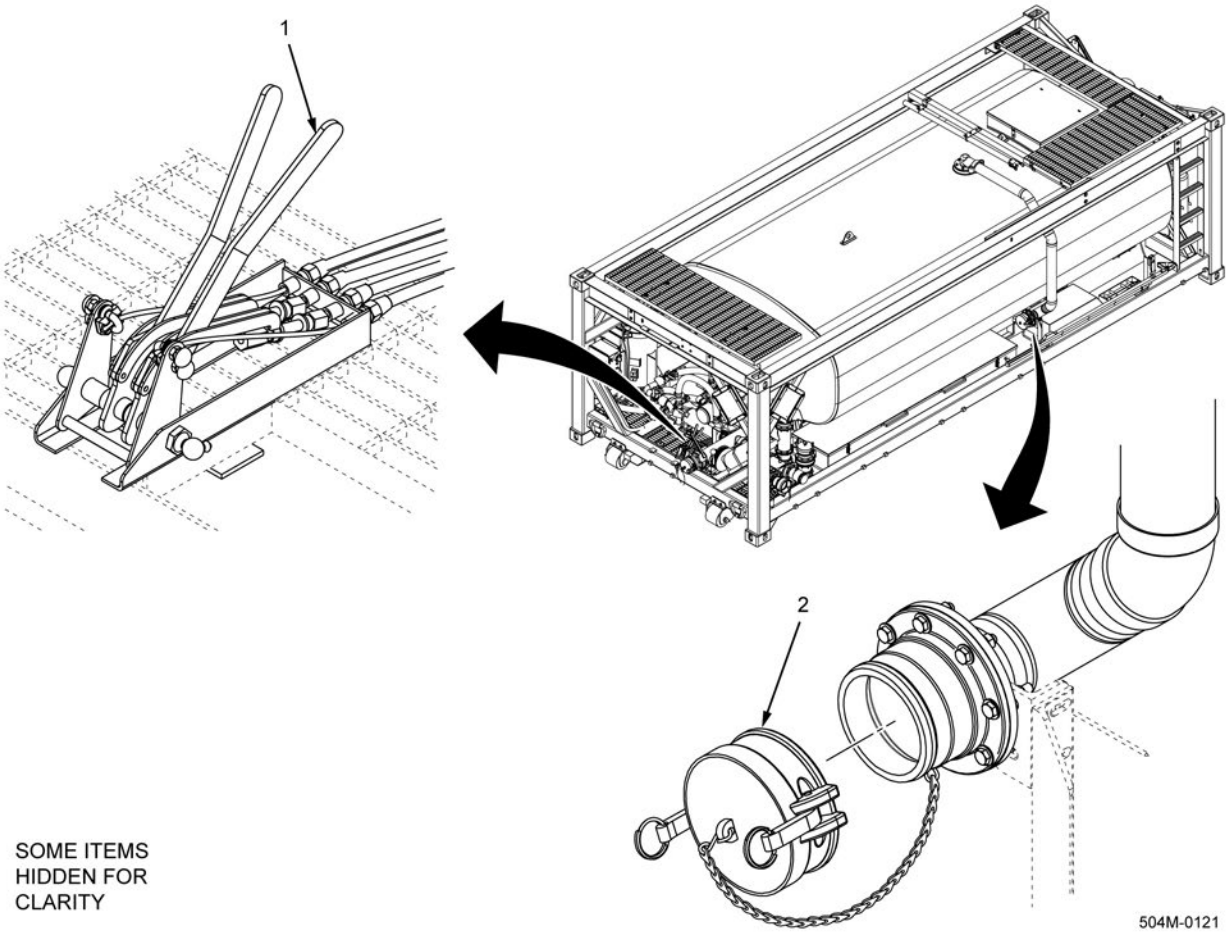


Figure 1. Fuel System Venting.

NOTE

Steps 3 through 6 apply to both left and right side emergency levers.

3. At the emergency lever end, unscrew two nuts (Figure 2, Item 1) to loosen U-bolt (Figure 2, Item 2) and release cable (Figure 2, Item 3).
4. At control lever assembly, remove two cap nuts (Figure 2, Item 6).
5. Remove two nuts (Figure 2, Item 7) and U-bolt (Figure 2, Item 5) to release cable (Figure 2, Item 3).
6. Pull cable (Figure 2, Item 3) out of tubing (Figure 2, Item 4) and remove from MFS TRM.

EMERGENCY LEVER CABLE REPLACEMENT - REMOVAL - Continued

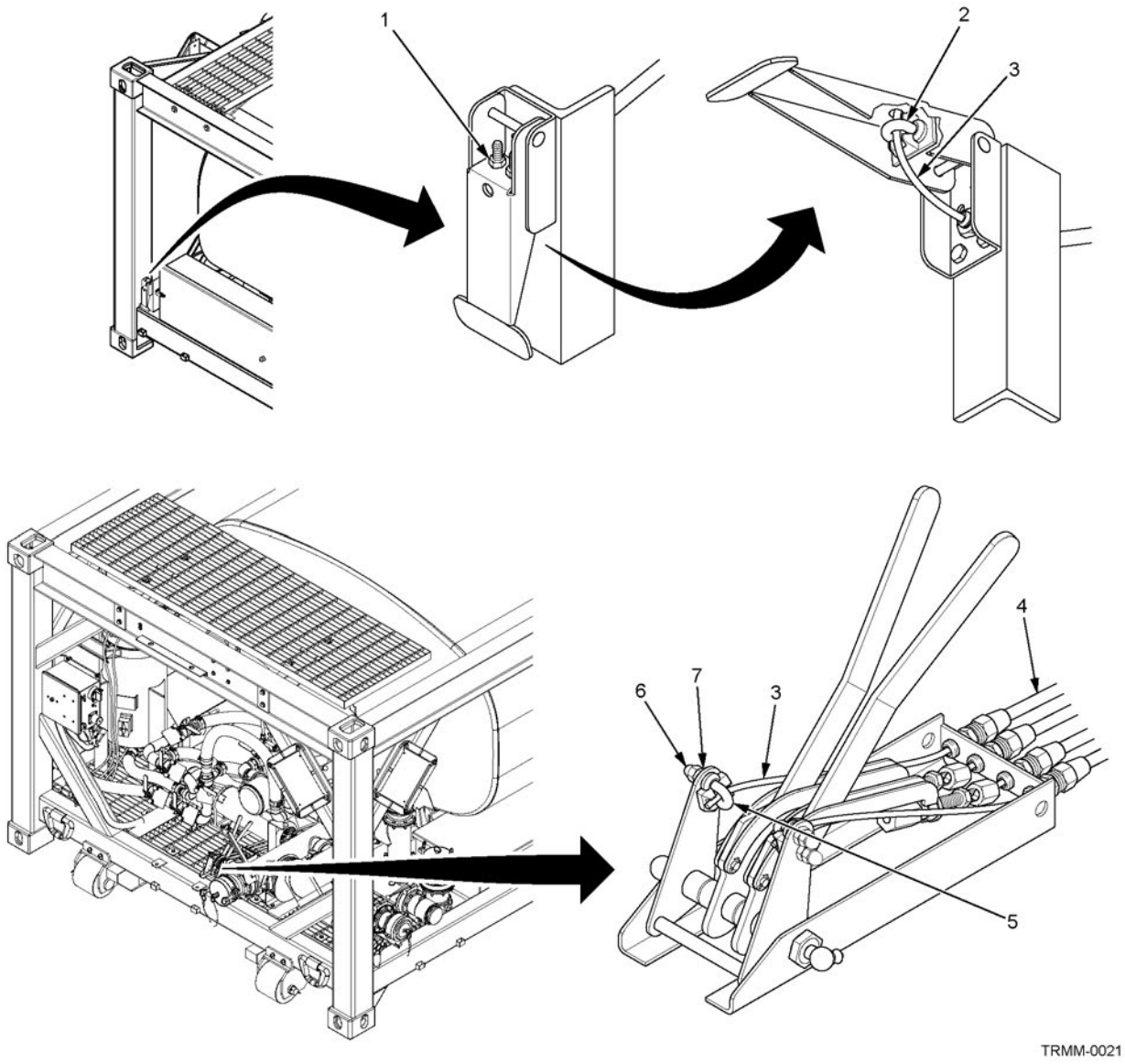


Figure 2. Replacing Emergency Lever Cable.

END OF TASK

EMERGENCY LEVER CABLE REPLACEMENT- INSTALLATION

NOTE

If cable cannot be inserted into tube due to frayed ends, prepare new cable for installation by taping or tack welding end strands together.

EMERGENCY LEVER CABLE REPLACEMENT- INSTALLATION - Continued

NOTE

The following steps apply to both left and right side emergency levers.

1. Apply thin film of lubricant to cable to aid in installation.
2. Insert cable (Figure 2, Item 3) entirely through fitting and tubing (Figure 2, Item 4).
3. Insert cable end through U-bolt (Figure 2, Item 2) at lever making sure cable end is flush with hole in emergency lever.
4. Tighten two nuts (Figure 2, Item 1) on U-bolt (Figure 2, Item 2).
5. Open bottom loading valve (V1) control lever (Figure 3, Item 2) and tank discharge valve control lever (V2) (Figure 3, Item 1).

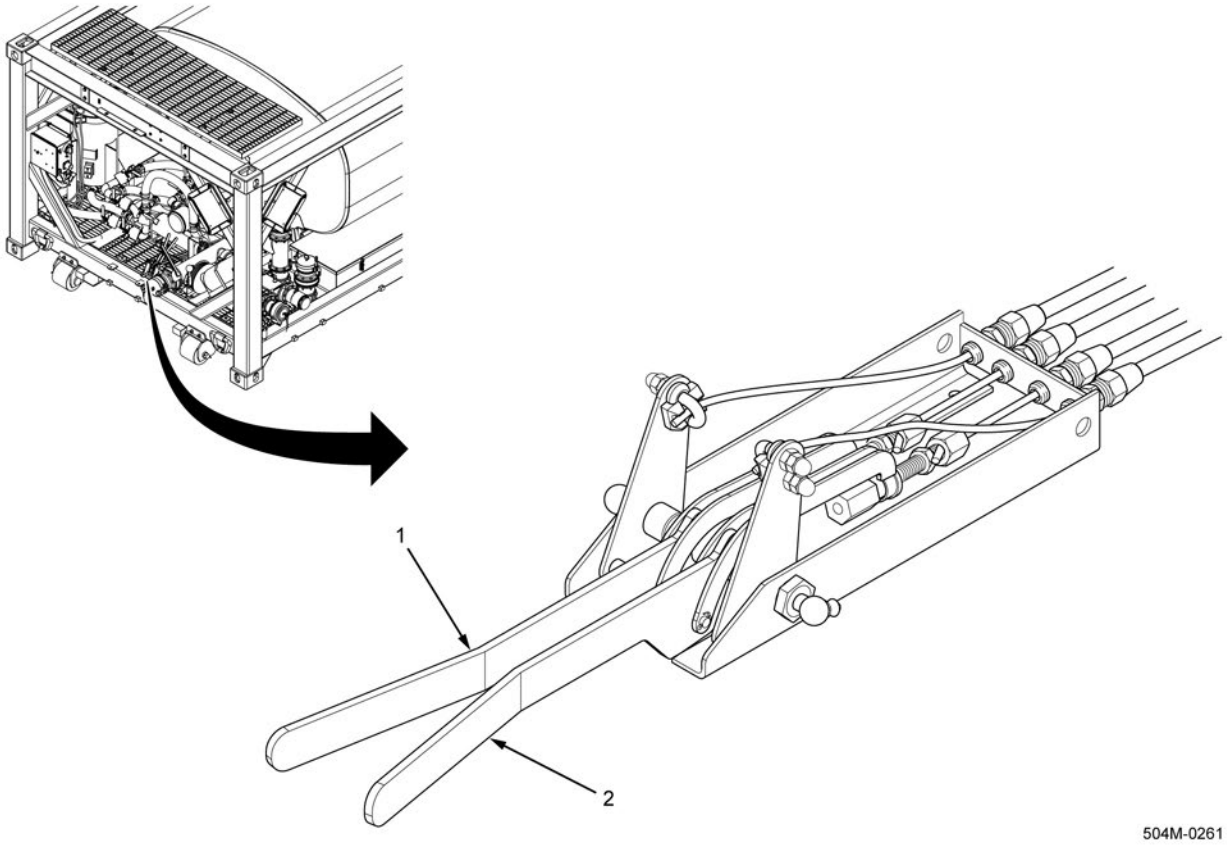


Figure 3. Replacing (V1) or (V2) Lever Cable.

6. Install U-bolt (Figure 2, Item 5) over cable (Figure 2, Item 3). Position U-bolt (Figure 2, Item 5) in lever assembly and loosely install two nuts (Figure 2, Item 7).
7. Pull cable (Figure 2, Item 3) tight.
8. While holding cable (Figure 2, Item 3) tight, tighten two nuts (Figure 2, Item 7).
9. If necessary, cut excess cable.
10. Install two cap nuts (Figure 2, Item 6).

EMERGENCY LEVER CABLE REPLACEMENT- INSTALLATION - Continued

11. Adjust cables (WP 0073).
12. Complete a test for emergency levers (WP 0073).

END OF TASK

BOTTOM LOADING VALVE (V1) OR TANK DISCHARGE VALVE (V2) CABLE REPLACEMENT - REMOVAL

CAUTION

Hold the hex feature on the fusible link with vise grips while tightening the clamping nut. Ensure holding with vise grips firmly or the fusible link will break off very easily.

1. At valve end, remove clamping nut (Figure 5, Items 4 or 10) to release cable (Figure 5, Items 3 or 9).
2. At control lever end, loosen clamping nut (Figure 4, Item 1) to release cable (Figure 4, Item 2).
3. Pull cable out of tubing and remove from MFS TRM.

END OF TASK

BOTTOM LOADING VALVE (V1) OR TANK DISCHARGE VALVE (V2) CABLE REPLACEMENT-INSTALLATION

CAUTION

Hold the hex feature on the fusible link with vise grips while tightening the clamping nut. Ensure holding with vise grips firmly or the fusible link will break off very easily.

NOTE

- If cable cannot be inserted into tube due to frayed ends, prepare new cable for installation by taping or tack welding end strands together.
- If installing new cable, keep excess cable at control lever assembly.

1. Apply thin film of lubricant to cable to aid in installation.
2. Insert cable (Figure 4, Item 2) through lever assembly, clamping nut (Figure 4, Item 1) and tubing until cable (Figure 4, Item 2) reaches the other end.

BOTTOM LOADING VALVE (V1) OR TANK DISCHARGE VALVE (V2) CABLE REPLACEMENT-INSTALLATION - Continued

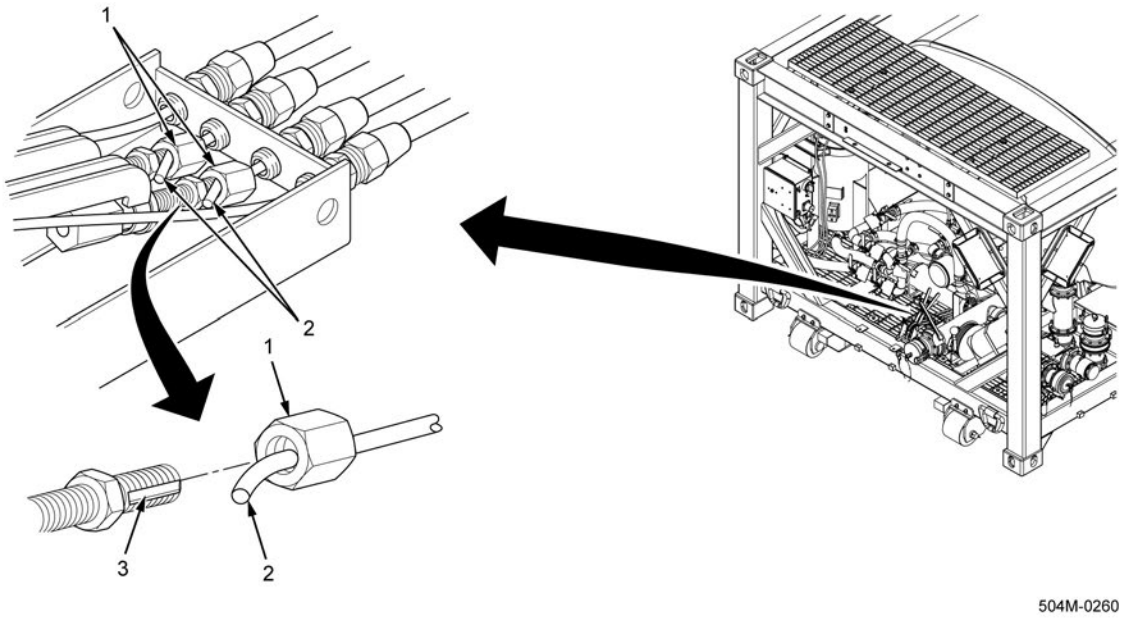


Figure 4. Replacing (V1) or (V2) Lever Cable.

3. At bottom loading valve (V1) or tank discharge valve (V2) end:

   a. At bottom loading valve (V1), lay cable (Figure 5, Item 9) in slot (Figure 5, Item 7) on fusible link (Figure 5, Item 1) and secure with clamping nut (Figure 5, Item 10) while holding hex (Figure 5, Item 8).

   b. At tank discharge valve (V2), lay cable (Figure 5, Item 3) in slot (Figure 5, Item 5) on fusible link (Figure 5, Item 2) and secure with clamping nut (Figure 5, Item 4) while holding hex (Figure 5, Item 6).

BOTTOM LOADING VALVE (V1) OR TANK DISCHARGE VALVE (V2) CABLE REPLACEMENT-INSTALLATION - Continued

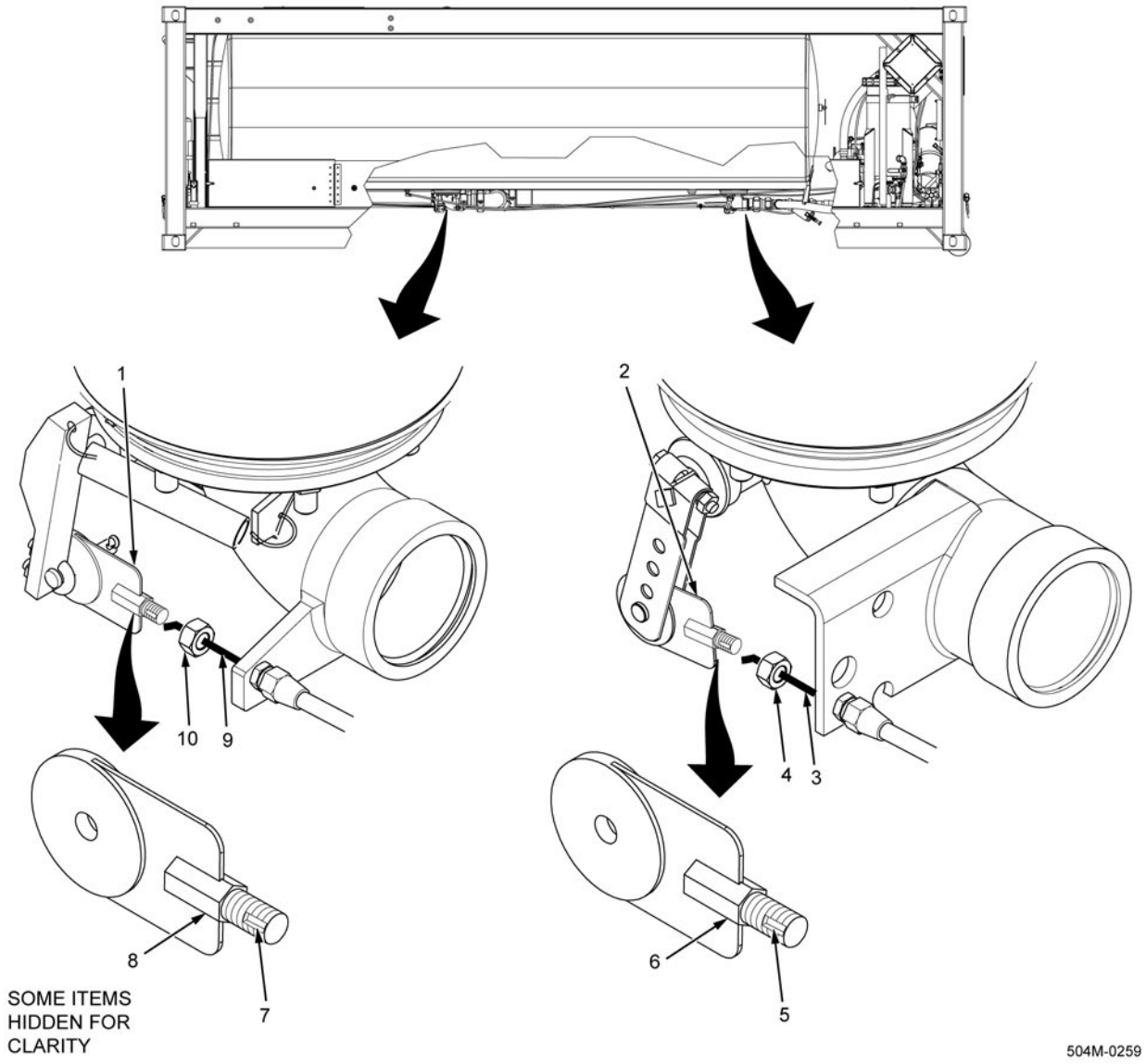


Figure 5. Installing (V1) or (V2) Lever Cable in Fusible Link.

4. Pull cable (Figure 4, Item 2) tight until there is no slack in cable. Lay cable in slot (Figure 4, Item 3) in adjustment rod then tighten clamping nut (Figure 4, Item 1).
5. Install vapor recovery line dust cap (Figure 6, Item 1).

BOTTOM LOADING VALVE (V1) OR TANK DISCHARGE VALVE (V2) CABLE REPLACEMENT-INSTALLATION - Continued

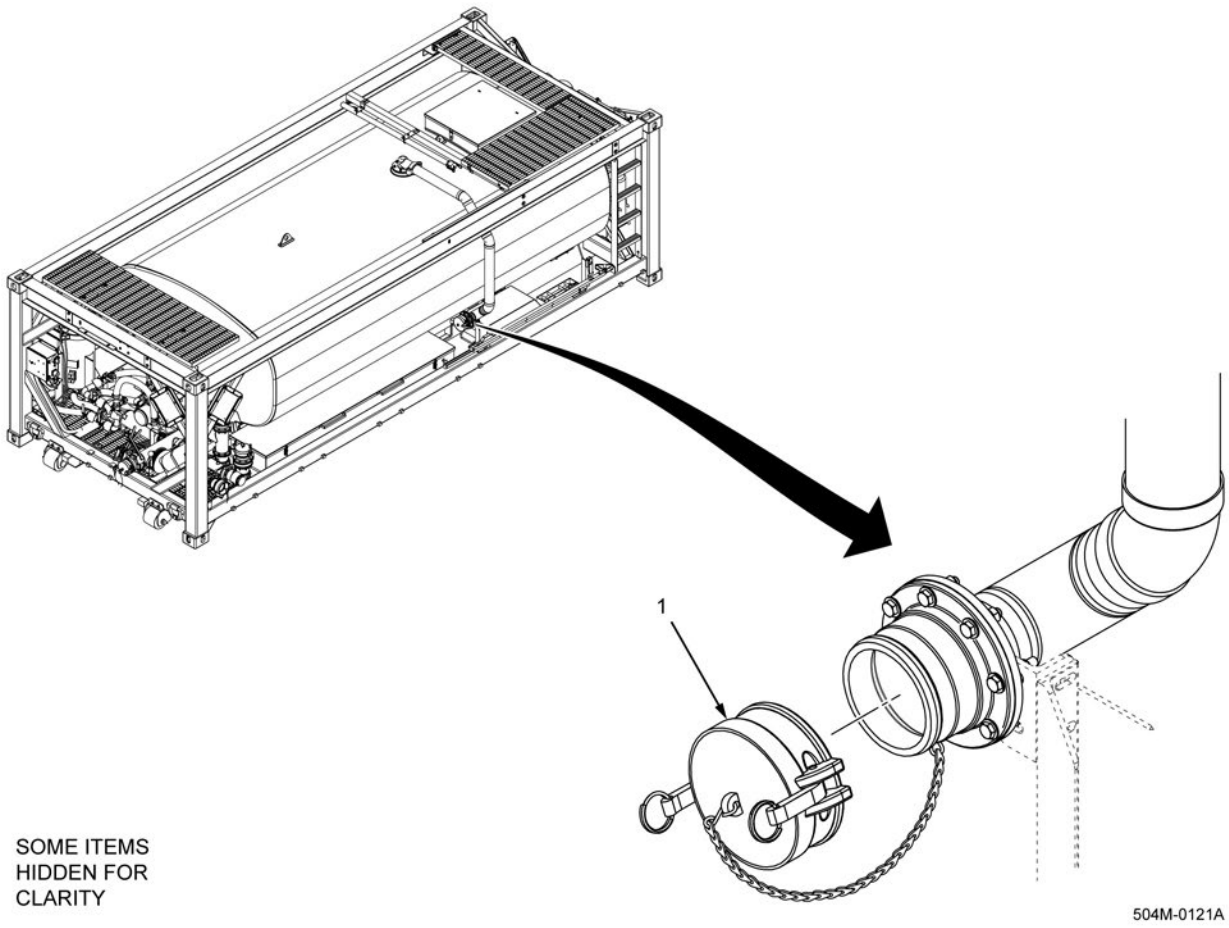


Figure 6. Installing Vapor Recovery Line Dust Cap.

END OF TASK

FOLLOW-ON MAINTENANCE

Adjust cables (WP 0073).

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
EMERGENCY LEVERS REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool kit, general mechanic's (WP 0217, Table 1, Item 13)

Materials/Parts
Nut, self-locking, hexagon (LOCKNUTS) Qty: 2 (WP 0169, Figure 23, Item 5)
Latch Assembly, Dump (WP 0169, Figure 23, Item 2)

Personnel Required
91J Quartermaster and Chemical Equipment Repairer

References
WP 0073

Equipment Condition
MFS TRM grounded (TM 10-4930-371-10)
MFS TRM shut down (TM 10-4930-371-10)

Time to Complete
1 Hour(s)

REMOVAL

NOTE

The following steps apply to both left and right emergency levers.

1. Unscrew two nuts (Figure 1, Item 1) to loosen U-bolt (Figure 1, Item 2) and release cable (Figure 1, Item 3) from lever assembly (Figure 1, Item 7).
2. Remove nut (Figure 1, Item 4) from cable tube fitting (Figure 1, item 6).

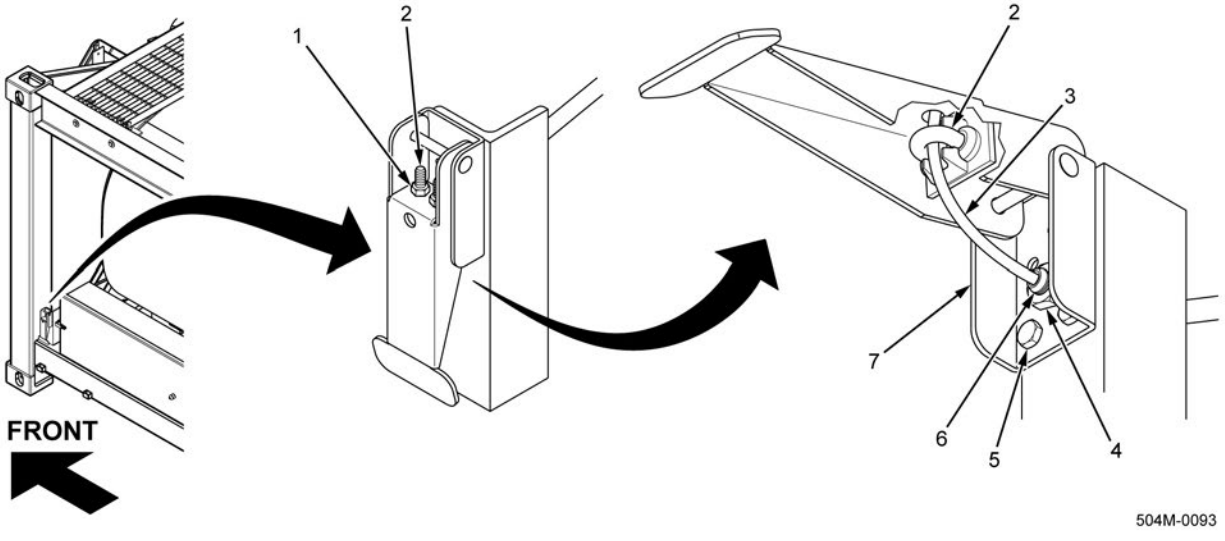


Figure 1. Removing and Installing Cable.

REMOVAL - Continued

3. Remove two bolts (Figure 2, Item 3), and two locknuts (Figure 2, Item 2) and remove lever assembly (Figure 2, Item 1). Discard locknuts.

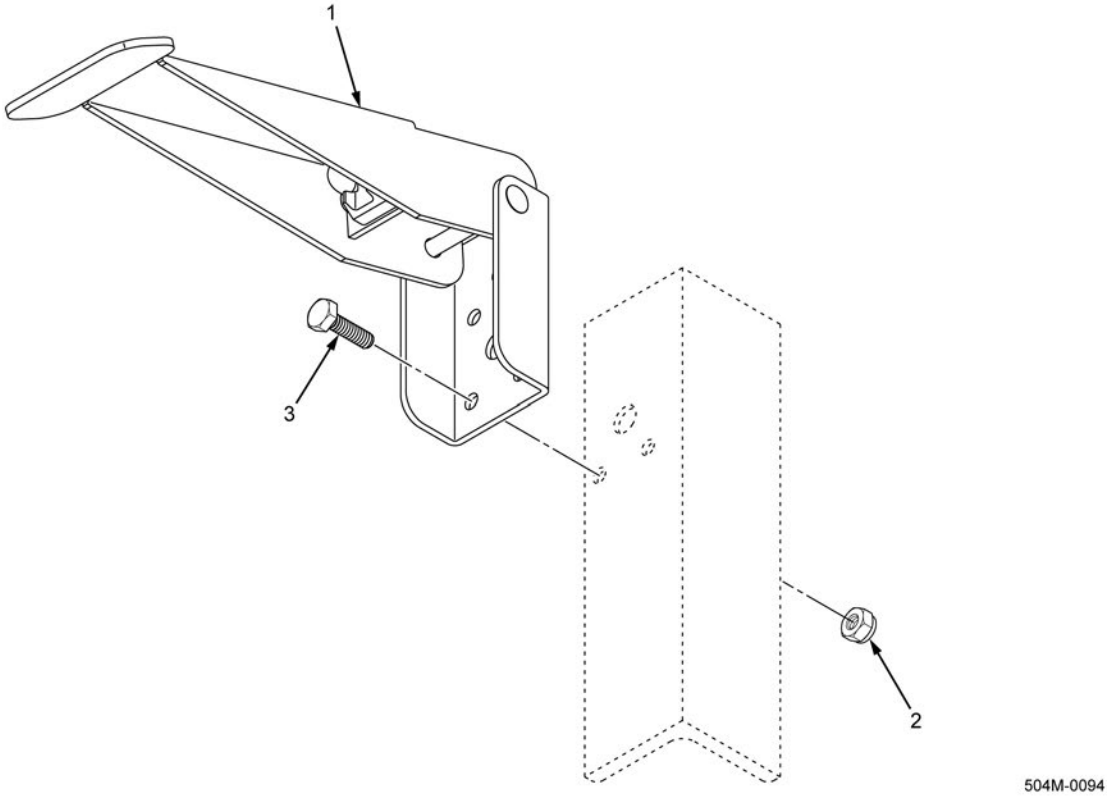


Figure 2. Replacing Emergency Lever.

END OF TASK

INSTALLATION

1. Install lever assembly (Figure 2, Item 1) and secure with two bolts (Figure 2, Item 3), and two new locknuts (Figure 2, Item 2).
2. Secure cable tube fitting (Figure 1, Item 6) with nut (Figure 1, item 4).
3. Secure end of cable (Figure 1, Item 3) using U-bolt (Figure 1, Item 2) by tightening two nuts (Figure 1, Item 1).

END OF TASK

FOLLOW-ON MAINTENANCE

Adjust cables (WP 0073).

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
CONTROL CABLE TUBING ASSEMBLY REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool kit, general mechanic's (WP 0217, Table 1, Item 13)

Materials/Parts
Ferrule Qty: 20 (WP 0170, Figure 24, Item 3)
Grease Tube Fitting Qty: 6 (WP 0170, Figure 24, Item 4)
Nut, Self-Locking, Hexagon Qty: 2 (WP 0170, Figure 24, Item 6)
Tube nut Qty: 20 (WP 0170, Figure 24, Item 2)
Tube, cable route #1 (WP 0170, Figure 24, Item 17)
Tube, cable route #2 (WP 0170, Figure 24, Item 18)
Tube, cable route #5 (WP 0170, Figure 24, Item 21)
Tube, cable route #6 (WP 0170, Figure 24, Item 5)
Tube, cable route #7 (WP 0170, Figure 24, Item 20)
Tube, cable route #8 (WP 0170, Figure 24, Item 12)
Tube, cable route #9 (WP 0170, Figure 24, Item 19)
Tube, cable route #10 (WP 0170, Figure 24, Item 13)

Materials/Parts (cont.)
Tubing (WP 0170, Figure 24, Item 14)
Tubing (WP 0170, Figure 24, Item 15)

Personnel Required
91J Quartermaster and Chemical Equipment Repairer (2)

References
WP 0073
WP 0075

Equipment Condition
MFS TRM grounded (TM 10-4930-371-10)
MFS TRM shut down (TM 10-4930-371-10)
MFS TRM loaded on PLS trailer (TM 10-4930-371-10)
Ladder emplaced (TM 10-4930-371-10)
Control cable replacement, removed (WP 0075)

Time to Complete
5 Hour(s)

LEFT SIDE EMERGENCY LEVER CABLE TUBING — REMOVAL

NOTE

Note orientation of hardware and components to aid in installation.

1. Refer to Figure 1 to identify the section or sections to be removed.
   a. Front (Figure 1, Item 1).
   b. Middle (Figure 1, Item 17).
   c. Rear (Figure 1, Item 18).
2. To remove the middle section (Figure 1, Item 17):
   a. Loosen four cable clamps (Figure 1, Item 10) on bottom piping assembly (Figure 1, Item 16) to release tubing (Figure 1, Item 17).
   b. Disengage two tube nuts (Figure 1, Item 14) and ferrules (Figure 1, Item 13) from grease fittings (Figure 1, Item 15).
   c. If necessary, disengage tube nut (Figure 1, Item 11 or 23) and ferrule (Figure 1, Item 12 or 24) from grease fittings (Figure 1, Item 15). Discard grease fitting.
   d. Remove middle section of tubing (Figure 1, Item 17).
3. To remove the front tubing section (Figure 1, Item 1):

NOTE

Note orientation of hardware and components to aid in installation.

   a. Disengage tube (Figure 1, Item 11) and ferrule (Figure 1, Item 12) from grease fitting (Figure 1, Item 15).
   b. If necessary, disengage tube nut (Figure 1, Item 14) and ferrule (Figure 1, Item 13) from grease fitting (Figure 1, Item 15). Discard grease fitting.
   c. At emergency lever (Figure 1, Item 25) end, disengage tube nut (Figure 1, Item 27) and ferrule (Figure 1, Item 26) from brass fitting on back of emergency lever (Figure 1, Item 25) to release front tubing section (Figure 1, Item 1) assembly from emergency lever (Figure 1, Item 25).
   d. Remove bolt (Figure 1, Item 5), flat washer (Figure 1, Item 6), locknut (Figure 1, Item 7), and tubing clamp (Figure 1, Item 4) from MFS TRM frame. Discard locknut.
   e. Remove front tubing section (Figure 1, Item 1).

LEFT SIDE EMERGENCY LEVER CABLE TUBING — REMOVAL - Continued

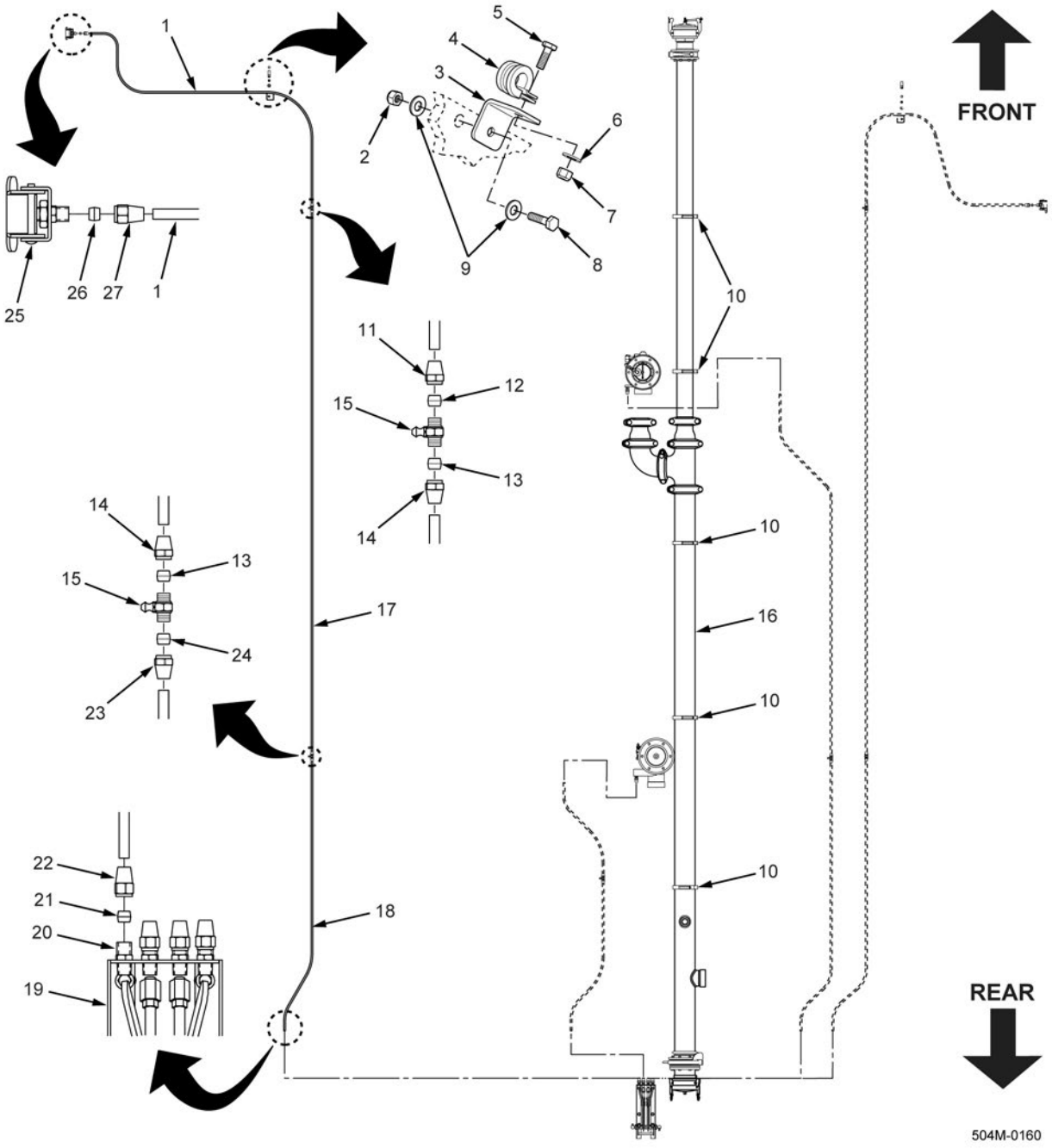


Figure 1. Removing Left Side Emergency Lever Cable Tubing.

4. To remove the rear tubing section (Figure 1, Item 18):
   a. Loosen one cable clamp (Figure 1, Item 10) on bottom piping assembly (Figure 1, Item 16) to release tubing (Figure 1, Item 18).

LEFT SIDE EMERGENCY LEVER CABLE TUBING — REMOVAL - Continued

b. Disengage tube nut (Figure 1, Item 23) and ferrule (Figure 1, Item 24) from grease fitting (Figure 1, Item 15).

c. If necessary, disengage tube nut (Figure 1, Item 14) and ferrule (Figure 1, Item 13) from grease fitting (Figure 1, Item 15). Discard grease fitting.

d. At control lever assembly (Figure 1, Item 19) end, disengage tube nut (Figure 1, Item 22) and ferrule (Figure 1, Item 21) from fitting (Figure 1, Item 20).

e. Remove rear section of tubing (Figure 1, Item 18).

END OF TASK

LEFT SIDE EMERGENCY CABLE TUBING — INSTALLATION

1. Refer to Figure 1 to identify the tubing section or sections to be installed.
   a. Front tubing section (Figure 1, Item 1).
   b. Middle tubing section (Figure 1, Item 17).
   c. Rear tubing section (Figure 1, Item 18).
2. To install the middle tubing section (Figure 1, Item 17):
   a. If necessary, install new grease fitting (Figure 1, Item 15) and secure with tube nut (Figure 1, Item 11 or 23) and ferrule (Figure 1, Item 12 or 24).
   b. Install middle tubing section (Figure 1, Item 17) and secure with two new tube nuts (Figure 1, Item 14) and new ferrules (Figure 1, Item 13) to grease fittings (Figure 1, Item 15) on front tubing section (Figure 1, Item 1) and rear tubing section (Figure 1, Item 18).

CAUTION

Do not overtighten cable clamps. Damage to equipment could occur.

   c. Tighten four cable clamps (Figure 1, Item 10).
3. To install the front tubing section (Figure 1, Item 1):

CAUTION

New tubing will need to be aligned as noted during removal. Special care should be taken while bending tubing to avoid kinks which will prevent control cable from moving freely within the tube.

   a. If necessary, install new grease fitting (Figure 1, Item 15) and secure with tube nut (Figure 1, Item 14) and ferrule (Figure 1, Item 13).
   b. Install front tubing section (Figure 1, Item 1) and secure with new tube nut (Figure 1, Item 11) and ferrule (Figure 1, Item 12) to grease fitting (Figure 1, Item 15) on middle tubing section (Figure 1, Item 17).
   c. At emergency lever end (Figure 1, Item 25), install front tubing section (Figure 1, Item 1) with new tube nut (Figure 1, Item 27) and new ferrule (Figure 1, Item 26) on brass fitting on back of emergency lever (Figure 1, Item 25).
   d. Install tubing clamp (Figure 1, Item 4) to MFS TRM frame and secure with bolt (Figure 1, Item 5), flat washer (Figure 1, Item 6) and new locknut (Figure 1, item 7).
4. To install the rear tubing section (Figure 1, Item 18):

LEFT SIDE EMERGENCY CABLE TUBING — INSTALLATION - Continued

a. If necessary, install new grease fitting (Figure 1, Item 15) and secure with tube nut (Figure 1, Item 14) and ferrule (Figure 1, Item 13).

b. Install rear tubing section (Figure 1, Item 18) and secure with new tube nut (Figure 1, Item 23) and new ferrule (Figure 1, Item 24) to grease fitting (Figure 1, Item 15) on middle tubing section (Figure 1, Item 17).

c. At control lever assembly (Figure 1, Item 19) end, install rear tubing section (Figure 1, Item 18) with new tube nut (Figure 1, Item 22) and new ferrule (Figure 1, Item 21) to fitting (Figure 1, Item 20) on control lever assembly (Figure 1, Item 19).

CAUTION

Do not overtighten cable clamps. Damage to equipment could occur.

d. Tighten one cable clamp (Figure 1, Item 10) on bottom piping assembly (Figure 1, Item 10).

END OF TASK

RIGHT SIDE EMERGENCY LEVER CABLE TUBING — REMOVAL

NOTE

Note orientation of hardware and components to aid in installation.

1. Refer to Figure 2 to identify the section or sections to be removed.
   a. Front (Figure 2, Item 6).
   b. Middle (Figure 2, Item 18).
   c. Rear (Figure 2, Item 21).
2. To remove the middle section (Figure 2, Item 18):
   a. Loosen four cable clamps (Figure 2, Item 26) on bottom piping assembly (Figure 2, Item 27) to release tubing (Figure 2, Item 18).
   b. Disengage two tube nuts (Figure 2, Item 5) and ferrules (Figure 2, Item 4) from grease fittings (Figure 2, Item 3).
   c. If necessary, disengage tube nut (Figure 2, Item 1 or 20) and ferrule (Figure 2, Item 2 or 19) from grease fittings (Figure 2, Item 3). Discard grease fitting.
   d. Remove middle tubing section (Figure 2, Item 18).
3. To remove the front tubing section (Figure 2, Item 6):
   a. Disengage tube (Figure 2, Item 1) and ferrule (Figure 2, Item 2) from grease fitting (Figure 2, Item 3).
   b. If necessary, disengage tube nut (Figure 2, Item 5) and ferrule (Figure 2, Item 4) from grease fitting (Figure 2, Item 3). Discard grease fitting.
   c. At emergency lever (Figure 2, Item 15) end, disengage tube nut (Figure 2, Item 17) and ferrule (Figure 2, Item 16) from brass fitting on back of emergency handle (Figure 2, Item 15) to release emergency cable tube (Figure 2, Item 6) assembly from emergency lever (Figure 2, Item 13).
   d. Remove bolt (Figure 2, Item 9), flat washer (Figure 2, Item 8), locknut (Figure 2, Item 7), and tubing clamp (Figure 2, Item 10) from MFS TRM frame. Discard locknut.
   e. Remove right front tubing assembly (Figure 2, Item 6).

RIGHT SIDE EMERGENCY LEVER CABLE TUBING — REMOVAL - Continued

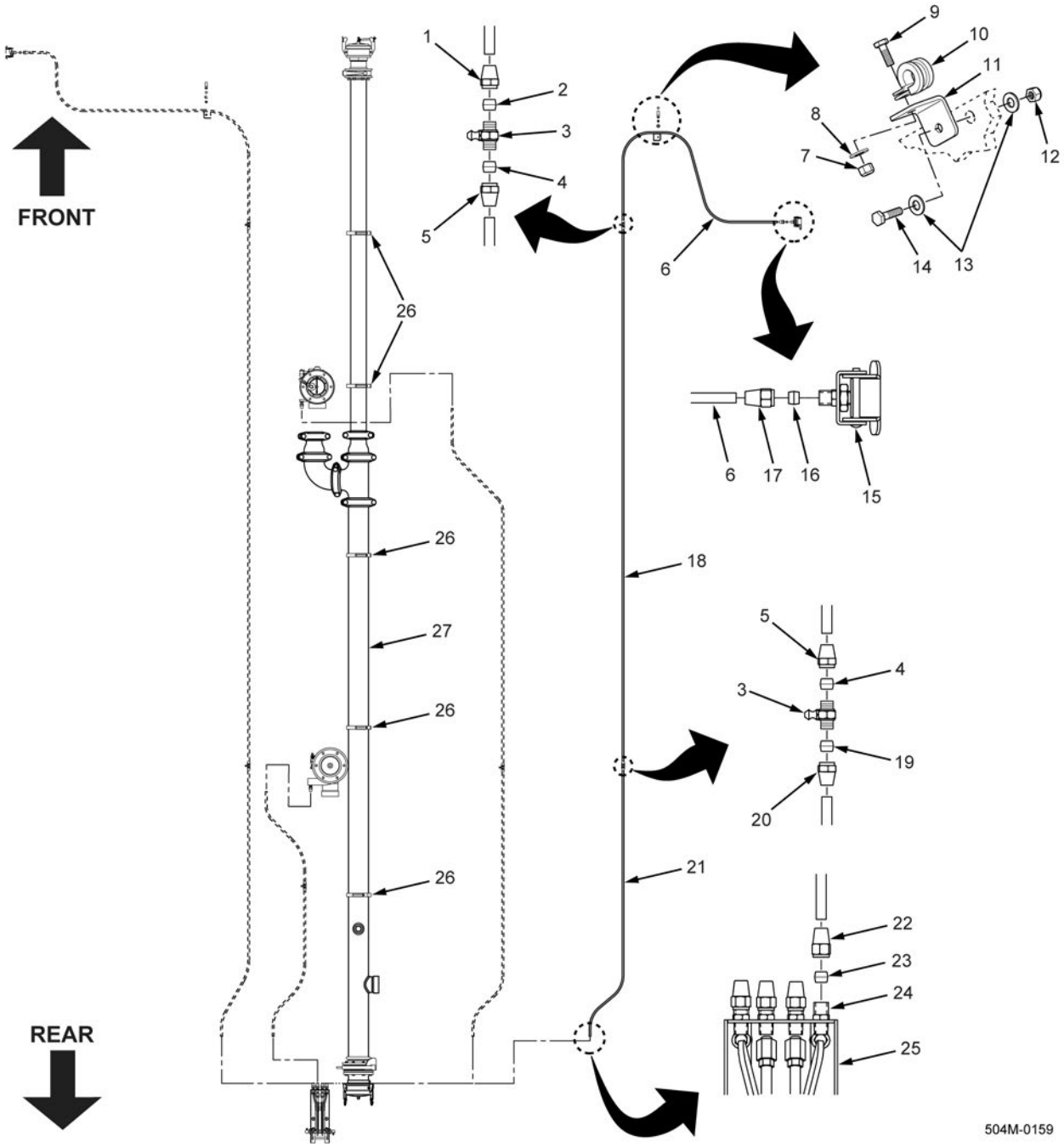


Figure 2. Removing Right Side Emergency Lever Cable Tubing.

4. To remove the rear tubing section (Figure 2, Item 21):
   a. Loosen one cable clamp (Figure 2, Item 26) on bottom piping assembly (Figure 2, Item 27) to release tubing (Figure 2 Item 21).

RIGHT SIDE EMERGENCY LEVER CABLE TUBING — REMOVAL - Continued

b. Disengage tube nut (Figure 2, Item 20) and ferrule (Figure 2, Item 19) from grease fitting (Figure 2, Item 3).

c. If necessary, disengage tube nut (Figure 2, Item 5) and ferrule (Figure 2, Item 4) from grease fitting (Figure 2, Item 3). Discard grease fitting.

d. At control lever assembly (Figure 2, Item 25) end, disengage tube nut (Figure 2, Item 22) and ferrule (Figure 2, Item 23) from fitting (Figure 2, Item 24).

e. Remove right side rear tubing assembly (Figure 2, Item 21).

END OF TASK

RIGHT SIDE EMERGENCY CABLE TUBING — INSTALLATION

1. Refer to Figure 2 to identify the tubing section or sections to be installed.
   a. Front tubing section (Figure 2, Item 6).
   b. Middle tubing section (Figure 2, Item 18).
   c. Rear tubing section (Figure 2, Item 21).
2. To install the middle tubing section (Figure 2, Item 18):
   a. If necessary, install new grease fitting (Figure 2, Item 3) and secure with tube nut (Figure 2, Item 1 or 20) and ferrule (Figure 2, Item 2 or 19).
   b. Install middle tubing section (Figure 2, Item 18) and secure with two new tube nuts (Figure 2, Item 5) and new ferrules (Figure 2, Item 4) to grease fittings (Figure 2, Item 3) on front tubing section (Figure 2, Item 6) and rear tubing section (Figure 2, Item 21).

CAUTION

Do not overtighten cable clamps. Damage to equipment could occur.

   c. Tighten four cable clamps (Figure 2, Item 25).
3. To install the front tubing section (Figure 2, Item 6):

CAUTION

New tubing will need to be aligned as noted during removal. Special care should be taken while bending tubing to avoid kinks which will prevent control cable from moving freely within the tube.

   a. If necessary, install new grease fitting (Figure 2, Item 3) and secure with tube nut (Figure 2, Item 5) and ferrule (Figure 2, Item 4).
   b. Install front tubing section (Figure 2, Item 6) and secure with new tube nut (Figure 2, Item 1) and new ferrule (Figure 2, Item 18) to grease fitting (Figure 2, Item 21) on middle tubing section (Figure 2, Item 18).
   c. At emergency lever end (Figure 2, Item 15), install front tubing section (Figure 2, Item 6) with new tube nut (Figure 2, Item 17) and new ferrule (Figure 2, Item 16) on brass fitting on back of emergency lever (Figure 2, Item 15).
   d. Install tubing clamp (Figure 2, Item 10) to MFS TRM frame and secure with bolt (Figure 2, Item 9), flat washer (Figure 2, Item 8) and new locknut (Figure 2, item 7).
4. To install the rear tubing section (Figure 2, Item 21):

RIGHT SIDE EMERGENCY CABLE TUBING — INSTALLATION - Continued

a. If necessary, install new grease fitting (Figure 2, Item 3) and secure with tube nut (Figure 2, Item 5) and ferrule (Figure 2, Item 4).

b. Install rear tubing section (Figure 2, Item 21) and secure with new tube nut (Figure 2, Item 20) and new ferrule (Figure 2, Item 19) to grease fitting (Figure 2, Item 6) on middle tubing section (Figure 2, Item 18).

c. At control lever assembly (Figure 2, Item 25) end, install rear tubing section (Figure 2, Item 21) with new tube nut (Figure 2, Item 22) and new ferrule (Figure 2, Item 23) to fitting (Figure 2, Item 24) on control lever assembly (Figure 2, Item 25).

CAUTION

Do not overtighten cable clamps. Damage to equipment could occur.

d. Tighten one cable clamp (Figure 2, Item 26) on bottom piping assembly (Figure 2, Item 27).

END OF TASK

(V1) CONTROL CABLE TUBING ASSEMBLY — REMOVAL

NOTE

Note orientation of hardware and components to aid in installation.

1. Refer to Figure 3 to identify the section or sections to be removed.
   a. Front (Figure 3, Item 11).
   b. Rear (Figure 3, Item 12).
2. To remove front tubing section (Figure 3, Item 11):
   a. Loosen three cable clamps (Figure 3, Item 2) on bottom piping assembly (Figure 3, Item 17) to release front tubing section (Figure 3, Item 11).
   b. Disengage tube nut (Figure 3, Item 6) and ferrule (Figure 3, Item 7) from grease fitting (Figure 3, Item 8).
   c. If necessary, disengage tube nut (Figure 3, Item 10) and ferrule (Figure 3, Item 9) from grease fitting (Figure 3, Item 8). Discard grease fitting.
   d. At bottom loading valve (V1), (Figure 3, Item 1), disengage tube nut (Figure 3, Item 5) and ferrule (Figure 3, Item 4) from fitting (Figure 3, Item 3) to release front tubing section (Figure 3, Item 11).
   e. Remove front tubing section (Figure 3, Item 11).
3. To remove rear section tubing (Figure 3, Item 12):
   a. Loosen cable clamp (Figure 3, Item 2) to release rear tubing section (Figure 3, Item 12).
   b. Disengage tube nut (Figure 3, Item 10) and ferrule (Figure 3, Item 9) from grease fitting (Figure 3, Item 8).
   c. If necessary, disengage tube nut (Figure 3, Item 6) and ferrule (Figure 3, Item 7) from grease fitting (Figure 3, Item 8). Discard grease fitting.
   d. At control lever assembly (Figure 3, Item 16) end, disengage tube nut (Figure 3, Item 13) and ferrule (Figure 3, Item 14) from fitting (Figure 3, Item 15).
   e. Remove rear section tubing (Figure 3, Item 12).

(V1) CONTROL CABLE TUBING ASSEMBLY — REMOVAL - Continued

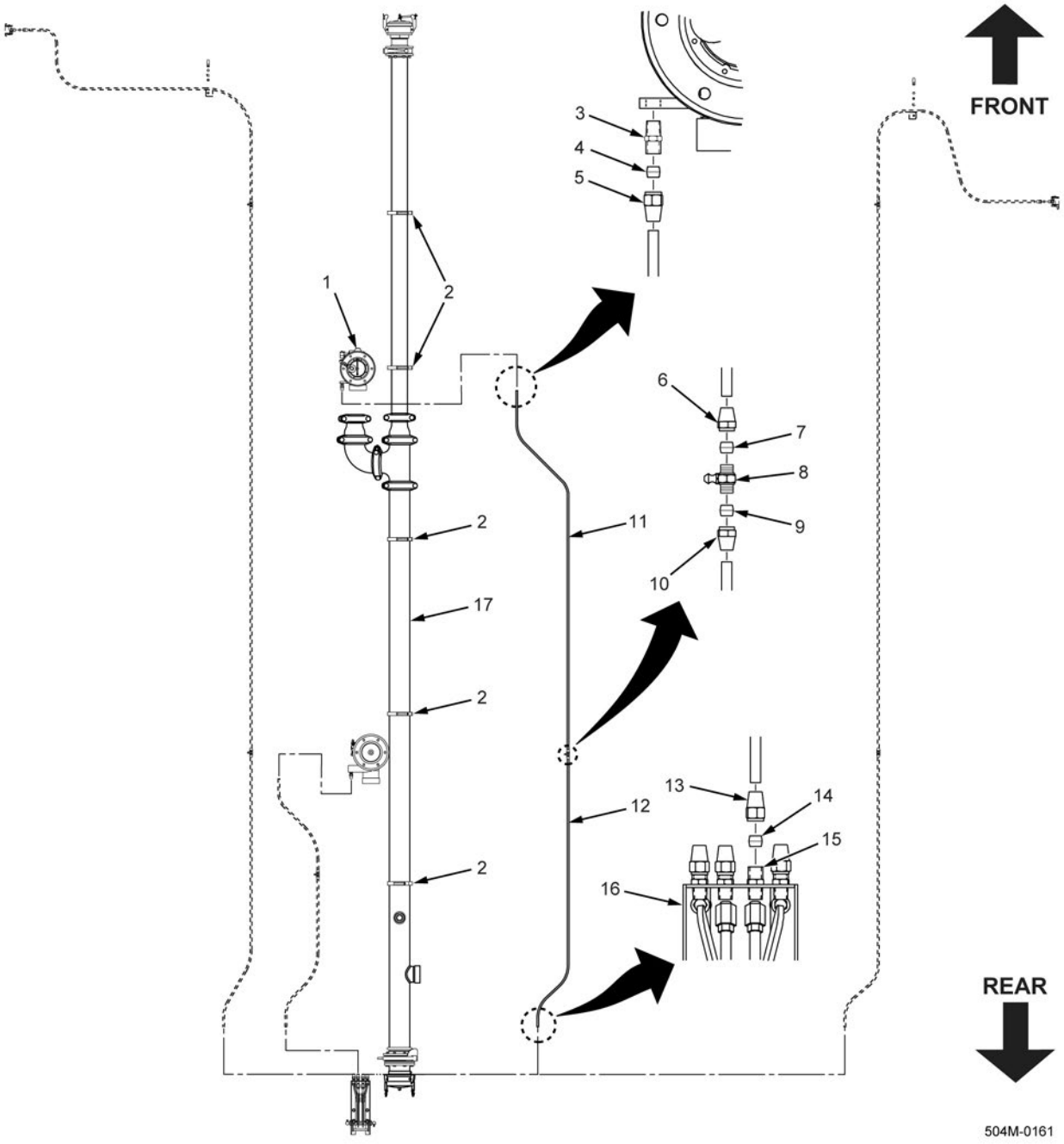


Figure 3. (V1) Control Cable Tubing Assembly.

END OF TASK

(V1) CONTROL CABLE TUBING ASSEMBLY — INSTALLATION

1. Refer to Figure 3 to identify the section or sections to be installed.

(V1) CONTROL CABLE TUBING ASSEMBLY — INSTALLATION - Continued

a. Front (Figure 3, Item 11).

b. Rear (Figure 3, Item 12).

2. To install the front tubing section (Figure 3 Item 11):

CAUTION

New tubing will need to be aligned as noted during removal. Special care should be taken while bending tubing to avoid kinks which will prevent control cable from moving freely within the tube.

a. If necessary, install new grease fitting (Figure 3, Item 8) and secure with tube nut (Figure 3, Item 10) and ferrule (Figure 3, Item 9).

b. Install front tubing section (Figure 3, Item 11) with new tube nut (Figure 3, Item 6) and new ferrule (Figure 3, Item 7) to grease fitting (Figure 3, Item 8) on rear tubing section (Figure 3, Item 12).

c. At Bottom Loading Valve (V1) (Figure 3, Item 1), install front tubing section (Figure 3, Item 11) with new tube nut (Figure 3, Item 5) and new ferrule (Figure 3, Item 4) on fitting (Figure 3, Item 3).

CAUTION

Do not overtighten cable clamps. Damage to equipment could occur.

d. Tighten three cable clamps (Figure 3, Item 2).

3. To install the rear tubing section (Figure 3, Item 12):

a. If necessary, install new grease fitting (Figure 3, Item 8) and secure with new tube nut (Figure 3, Item 6) and ferrule (Figure 3, Item 7).

b. Install rear tubing section (Figure 3, Item 12) with new tube nut (Figure 3, Item 10) and new ferrule (Figure 3, Item 9) to grease fitting (Figure 3, Item 8) on front tubing section (Figure 3, Item 11).

c. At control lever assembly (Figure 3, Item 16) end, install rear tubing section (Figure 3, Item 12) with new tube nut (Figure 3, Item 13) and new ferrule (Figure 3, Item 14) to fitting (Figure 3, Item 15) on control lever assembly (Figure 3, Item 16).

CAUTION

Do not overtighten cable clamps. Damage to equipment could occur.

d. Tighten cable clamp (Figure 3, Item 2).

END OF TASK

(V2) CONTROL CABLE TUBING ASSEMBLY — REMOVAL

1. Refer to Figure 4 to identify the section or sections to be removed.

NOTE

Note orientation of hardware and components to aid in installation.

a. Front (Figure 4, Item 5).

b. Rear (Figure 4, Item 6).

2. To remove the front tubing section (Figure 4, Item 5):

a. Disengage tube nut (Figure 4, Item 15) and ferrule (Figure 4, Item 14) from grease fitting (Figure 4, Item 13).

(V2) CONTROL CABLE TUBING ASSEMBLY — REMOVAL - Continued

b. If necessary, disengage tube nut (Figure 4, Item 11) and ferrule (Figure 4, Item 12) from grease fitting (Figure 4, Item 13). Discard grease fitting.

c. At tank discharge valve (V2) (Figure 4, Item 4), disengage tube nut (Figure 4, Item 3) and ferrule (Figure 4, Item 2) from fitting (Figure 4, Item 5) to release front tubing section (Figure 4, Item 5).

d. Remove front tubing section (Figure 4, Item 5).

3. To remove the rear tubing section (Figure 4, Item 6):

a. Disengage tube nut (Figure 4, Item 11) and ferrule (Figure 4, Item 12) from grease fitting (Figure 4, Item 13).

b. If necessary, disengage tube nut (Figure 4, Item 15) and ferrule (Figure 4, Item 14) from grease fitting (Figure 4, Item 13). Discard grease fitting.

c. At control lever assembly (Figure 4, Item 7) end, disengage tube nut (Figure 4, Item 10) and ferrule (Figure 4, Item 9) from fitting (Figure 4, Item 8).

d. Remove rear tubing section (Figure 4, Item 6).

(V2) CONTROL CABLE TUBING ASSEMBLY — REMOVAL - Continued

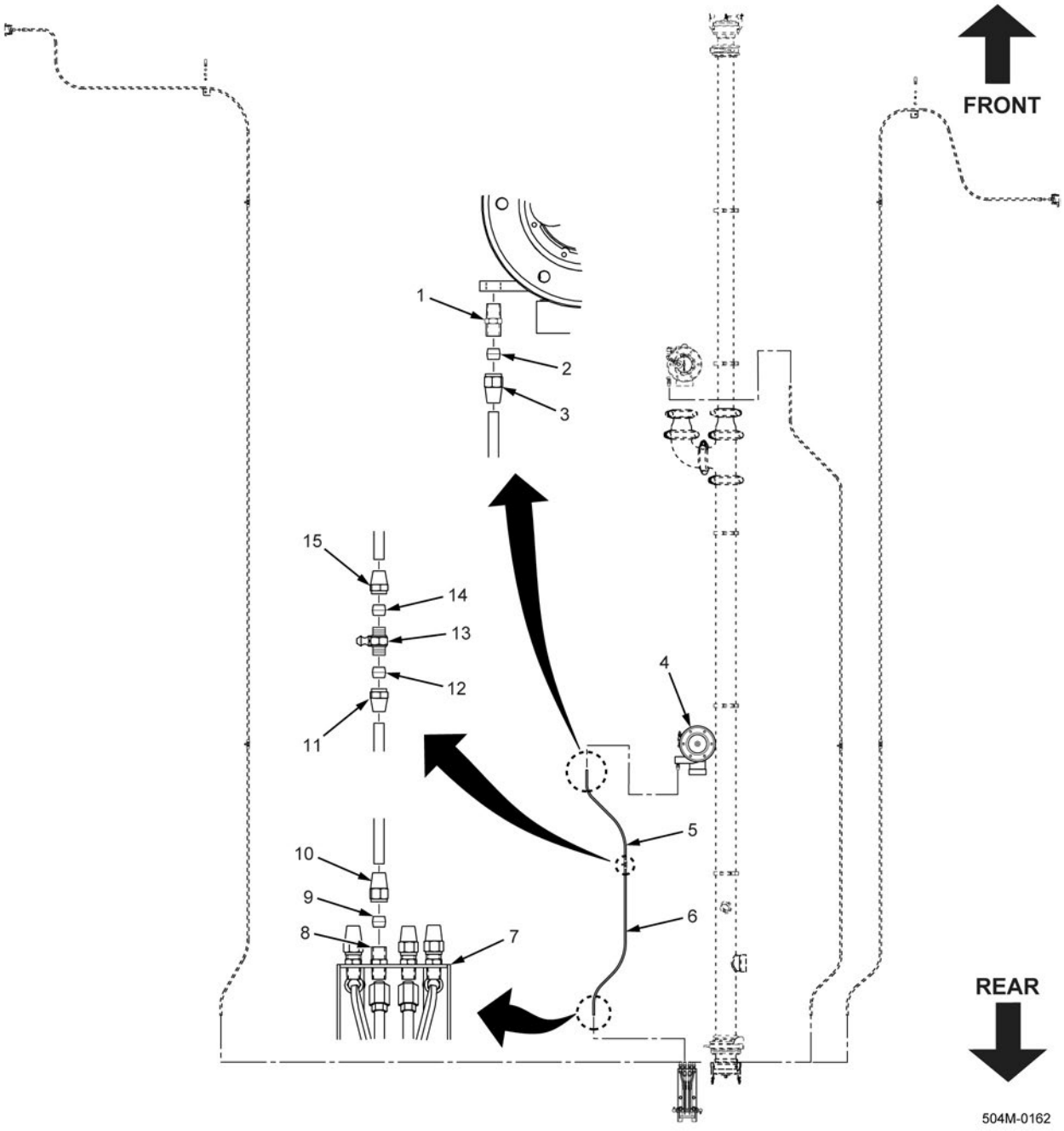


Figure 4. (V2) Control Cable Tubing Assembly.

END OF TASK

(V2) CONTROL CABLE TUBING ASSEMBLY — INSTALLATION

1. Refer to Figure 4 to identify the section or sections to be installed:

(V2) CONTROL CABLE TUBING ASSEMBLY — INSTALLATION - Continued

a. Front (Figure 4, Item 5).

b. Rear (Figure 4, Item 6).

2. To install the front tubing section (Figure 4, Item 5):

CAUTION

New tubing will need to be aligned as noted during removal. Special care should be taken while bending tubing to avoid kinks which will prevent control cable from moving freely within the tube.

a. If necessary, install new grease fitting (Figure 4, Item 13) and secure with tube nut (Figure 4, Item 11) and ferrule (Figure 4, Item 12).

b. Install front tubing section (Figure 4, Item 5) with new tube nut (Figure 4, Item 15) and new ferrule (Figure 4, Item 14) to grease fitting (Figure 4, Item 13) on rear tubing section (Figure 4, Item 6).

c. At Tank Discharge Valve (V2) (Figure 4, Item 4), install front tubing section (Figure 4, Item 5) with new tube nut (Figure 4, Item 3) and new ferrule (Figure 4, Item 2) on fitting (Figure 4, Item 1).

3. To install the rear tubing section (Figure 4, Item 6):

a. If necessary, install new grease fitting (Figure 4, Item 13) and secure with tube nut (Figure 4, Item 15) and ferrule (Figure 4, Item 14).

b. Install rear tubing assembly (Figure 4, Item 6) with new tube nut (Figure 4, Item 11) and new ferrule (Figure 4, Item 12) to grease fitting (Figure 4, Item 13) on front tubing section (Figure 4, Item 5).

c. At control lever assembly (Figure 4, Item 7) end, install rear tubing section (Figure 4, Item 6) with new tube nut (Figure 4, Item 10) and new ferrule (Figure 4 Item 9) to fitting (Figure 4, Item 8) on control lever assembly (Figure 4, Item 7).

END OF TASK

FOLLOW-ON MAINTENANCE

NOTE

Replace cable if it cannot be reinserted.

1. Replace Control Cable (WP 0075).
2. Adjust Control Cable Assemblies (WP 0073).

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
PRECHECK VALVE (V16) AND FLEX LINE REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposable nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)
- Pan, drip (WP 0217, Table 1, Item 8)
- Vise, machinist's (WP 0217, Table 1, Item 14)

Materials/Parts
- Absorbent material (WP 0216, Table 1, Item 1)
- Cable tie (WP 0216, Table 1, Item 14)
- Cleaning compound, solvent (WP 0216, Table 1, Item 3)
- Cloth, cleaning (WP 0216, Table 1, Item 4)
- Thread sealing compound (WP 0216, Table 1, Item 15)
- Valve, ball, 1/4-inch (WP 0171, Figure 25, Item 5)
- Ferrule Qty: 2 (WP 0171, Figure 25, Item 3)

Materials/Parts (cont.)
- Flex line (WP 0171, Figure 25, Item 8)
- Tube nut Qty: 2 (WP 0171, Figure 25, Item 2)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer (2)

References
- ATP 4-43
- TM 10-4930-371-10

Equipment Condition
- MFS TRM grounded (TM 10-4930-371-10)
- MFS TRM shut down (TM 10-4930-371-10)
- MFS TRM drained (TM 10-4930-371-10)

Time to Complete
- 2 Hour(s)

REMOVAL

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Use a drip pan to collect leaking fuel. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.

REMOVAL - Continued

NOTE

Note orientation of components and hardware to aid in installation.

1. Remove vapor recovery line dust cap (Figure 1, Item 2).
2. Momentarily open then close bottom loading valve (V1) (Figure 1, Item 1) to vent tank pressure.

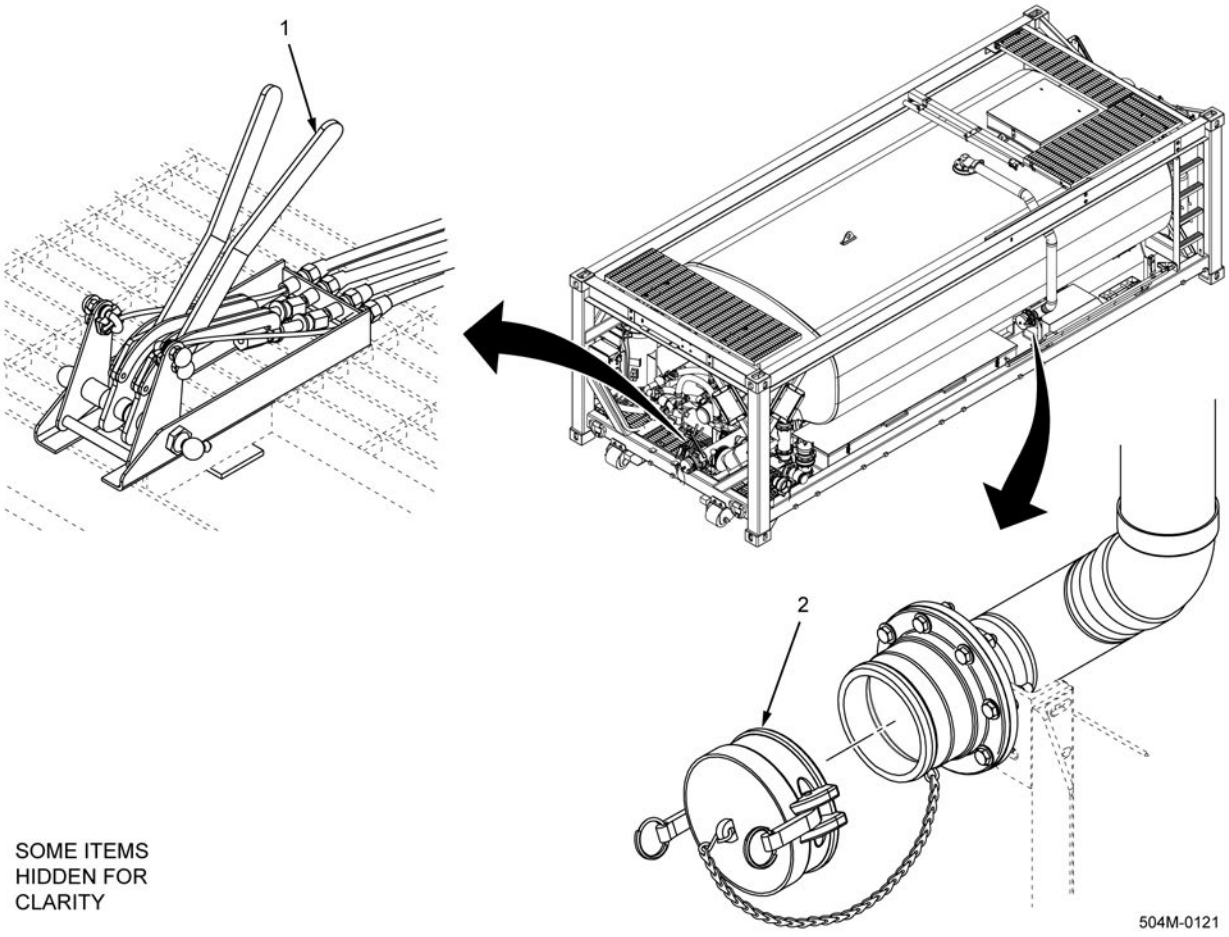


Figure 1. Fuel System Venting.

3. Place drip pan under valve to catch residual fuel.
4. Unscrew tube nut (Figure 2, Item 1) and disconnect tube (Figure 2, Item 8).
5. If damaged, remove tube nut (Figure 2, Item 1) and ferrule (Figure 2, Item 2) from tube. Discard tube nut and ferrule.
6. Unscrew and remove elbow (Figure 2, Item 5), nipple (Figure 2, Item 6), valve (Figure 2, Item 4), and adapter (Figure 2, Item 3) from piping (Figure 2, Item 7).
7. Remove elbow (Figure 2, Item 5) and nipple (Figure 2, Item 6) from valve (Figure 2, Item 4).
8. Remove adapter (Figure 2, Item 3) from valve (Figure 2, Item 4). Discard valve.

REMOVAL - Continued

9. Remove drip pan and dispose of fuel IAW unit SOP.

END OF TASK

CLEANING

WARNING

Solvent cleaning compound MIL-PRF-680 Type III is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Keep away from open flames and other sources of ignition. Failure to comply may cause injury to personnel.

1. Clean threads of all disassembled components. Remove all buildup of dirt, oil, and debris from threads.
2. Clean all metal parts with a cleaning cloth and solvent cleaning compound.
3. Allow parts to dry thoroughly.

END OF TASK

INSTALLATION

WARNING

Thread sealing compound is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Failure to comply may cause injury to personnel.

1. Apply thread sealing compound to all threads of all fittings except where tube nut connects to flex line.
2. Install elbow (Figure 2, Item 5), nipple (Figure 2, Item 6), and adapter (Figure 2, Item 3) on new ball valve (Figure 2, Item 4).
3. Install elbow (Figure 2, Item 5) on pipe (Figure 2, Item 7).
4. If necessary, install new ferrule (Figure 2, Item 2) and new tube nut (Figure 2, Item 1) on tube (Figure 2, Item 8).
5. Connect tube to adapter (Figure 2, Item 3) and secure with tube nut (Figure 2, Item 1).
6. Install vapor recovery line dust cap (Figure 1, Item 2).

INSTALLATION - Continued

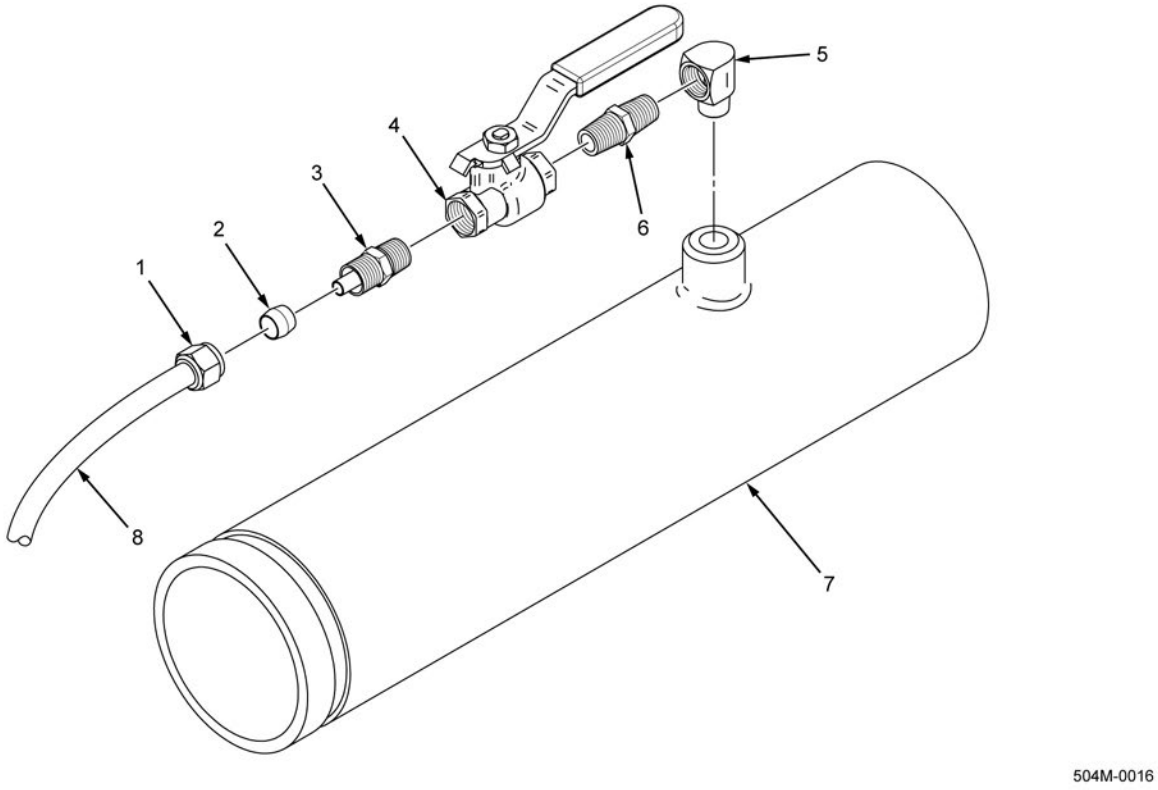


Figure 2. Replacing Precheck Valve (V16).

END OF TASK

FLEX LINE REMOVAL

1. Place MFS TRM on trailer.

NOTE

Note orientation of hardware and components to aid in installation.

2. Remove vapor recovery line dust cap (Figure 1, Item 2).
3. Loosen four cable clamps (Figure 3, Item 1).
4. Remove tube nut (Figure 3, Item 4) and ferrule (Figure 3, Item 3) from elbow (Figure 3, Item 2). On TRM with ADR, elbow (Figure 3, Item 2) is located on (V19) jet sensor check valve.
5. Remove tube nut (Figure 3, Item 7) and ferrule (Figure 3, Item 8) from adapter (Figure 3, Item 9).
6. Cut cable tie. Discard cable tie.
7. Remove flex line (Figure 3, Item 5) from MFS TRM.

FLEX LINE REMOVAL - Continued

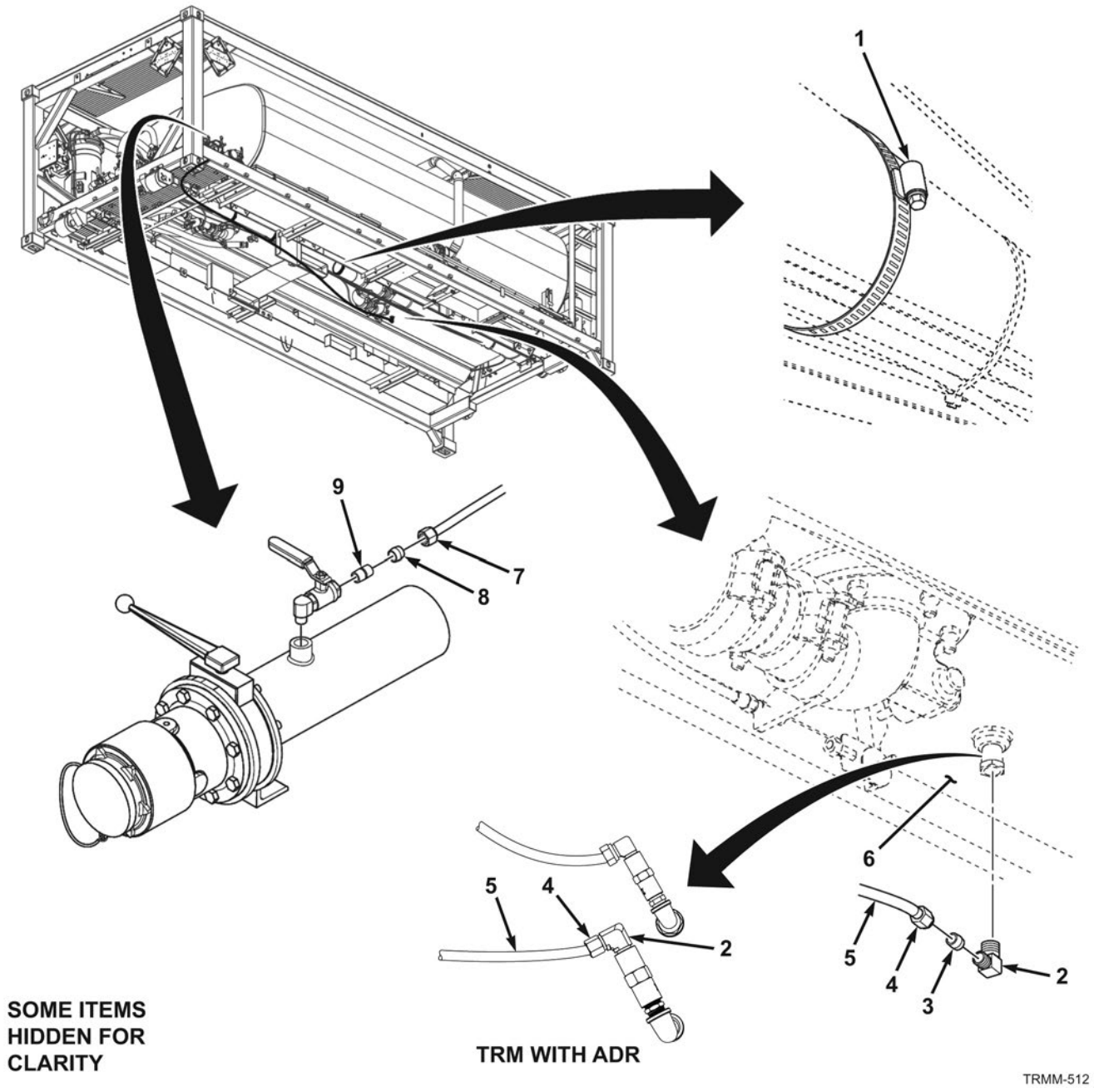


Figure 3. Replacing Flex Line.

END OF TASK

FLEX LINE INSTALLATION

WARNING

Thread sealing compound is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Failure to comply may cause injury to personnel.

1. Proceed to cleaning subtask in this WP.
2. Route flex line (Figure 3, Item 5) through hose clamps (Figure 3, Item 1) on MFS TRM.
3. Install new tube nut (Figure 3, Item 7) and ferrule (Figure 3, Item 8) on flex line.
4. Install tube nut (Figure 3, Item 4) and ferrule (Figure 3, Item 3) on elbow (Figure 3, Item 2) under tank (Figure 3, Item 6). On TRM with ADR, elbow (Figure 3, Item 2) is located on (V19) jet sensor check valve.

CAUTION

Do not overtighten cable clamps. Damage to equipment could occur.

5. Tighten four hose clamps (Figure 3, Item 1).
6. Install cable tie as noted during removal.
7. Install tube nut (Figure 3, Item 7) and ferrule (Figure 3, Item 8) on adapter (Figure 3, Item 9).
8. Install vapor recovery line dust cap (Figure 4, Item 1).

FLEX LINE INSTALLATION - Continued

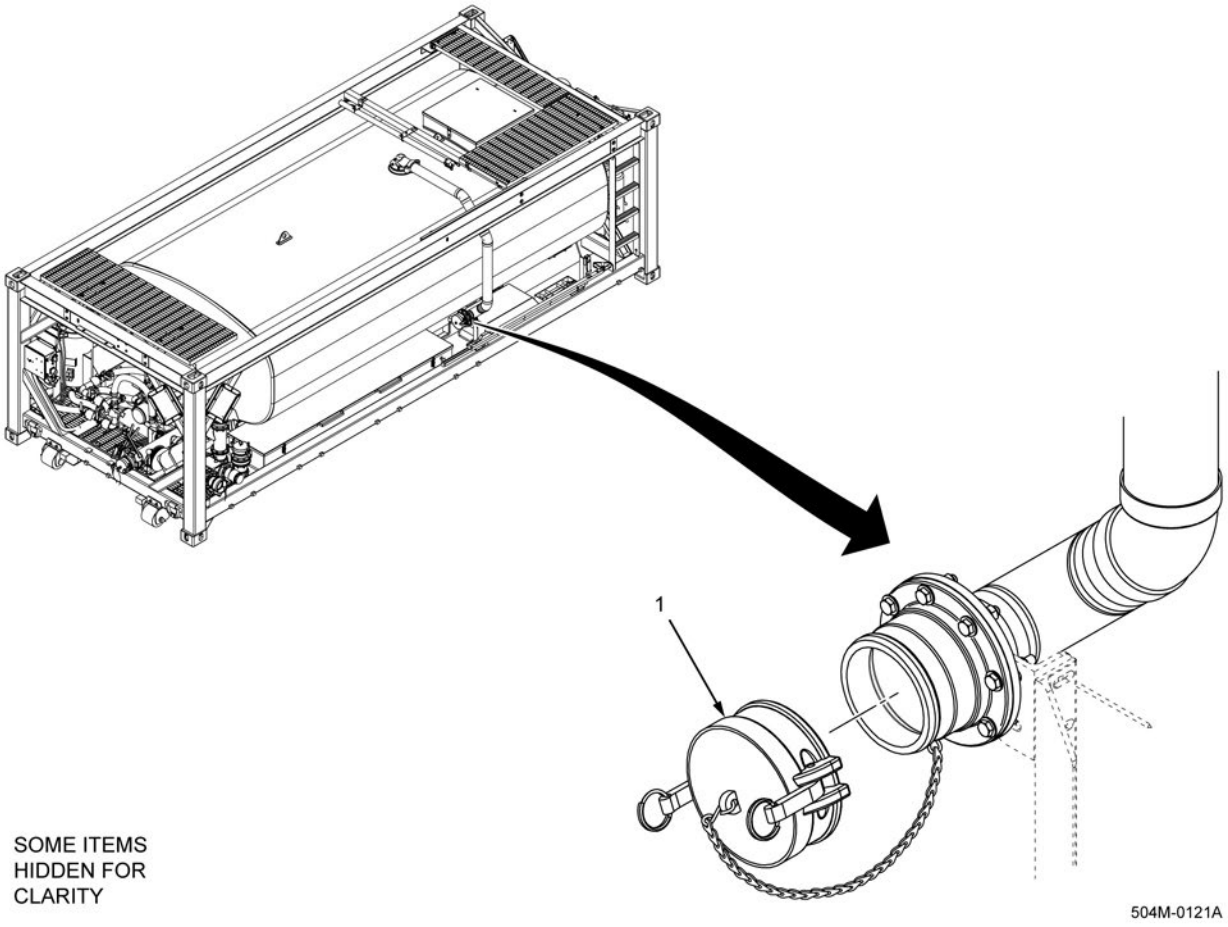


Figure 4. Installing Vapor Recovery Line Dust Cap.

9. Set MFS TRM on level ground.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Set up MFS TRM (TM 10-4930-371-10).
2. Check MFS TRM for leaks by recirculating fuel (TM 10-4930-371-10).

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
ELECTRIC MOTOR ASSEMBLY REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
Fire extinguisher (TM 10-4930-371-10)

Materials/Parts
Cable tie (WP 0216, Table 1, Item 14)
Nut, self-locking, hexagon (LOCKNUTS) Qty: 4 (WP 0172, Figure 26, Item 11)
Electric motor (WP 0172, Figure 26, Item 2)

Personnel Required
91J Quartermaster and Chemical Equipment Repairer (2)

References
WP 0080

Equipment Condition
MFS TRM grounded (TM 10-4930-371-10)
Pump assembly removed (WP 0080)

Time to Complete
1.5 Hour(s)

REMOVAL

WARNING

Electrical shock can cause injury or death to personnel. When working near, replacing, or servicing any electrical component, disconnect power cable. Ensure power is disconnected from MFS TRM before performing this procedure. Failure to comply may result in injury or death to personnel.

REMOVAL - Continued

NOTE

Note orientation of hardware and components to aid in installation.

1. Pull bottom loading valve (V1) control lever (Figure 1, Item 2) to OPEN position.
2. Pull tank discharge valve (V2) control lever (Figure 1, Item 1) to OPEN position.

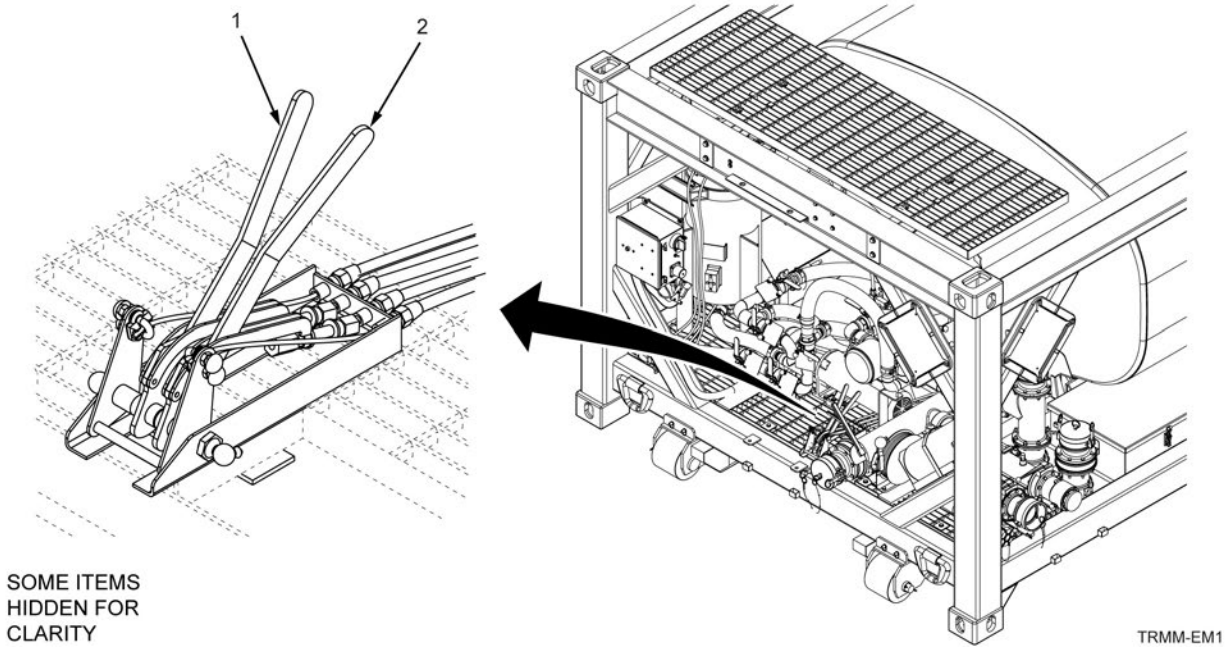


Figure 1. Valve Control Levers.

REMOVAL - Continued

3. Cut cable tie (Figure 2, Item 1).

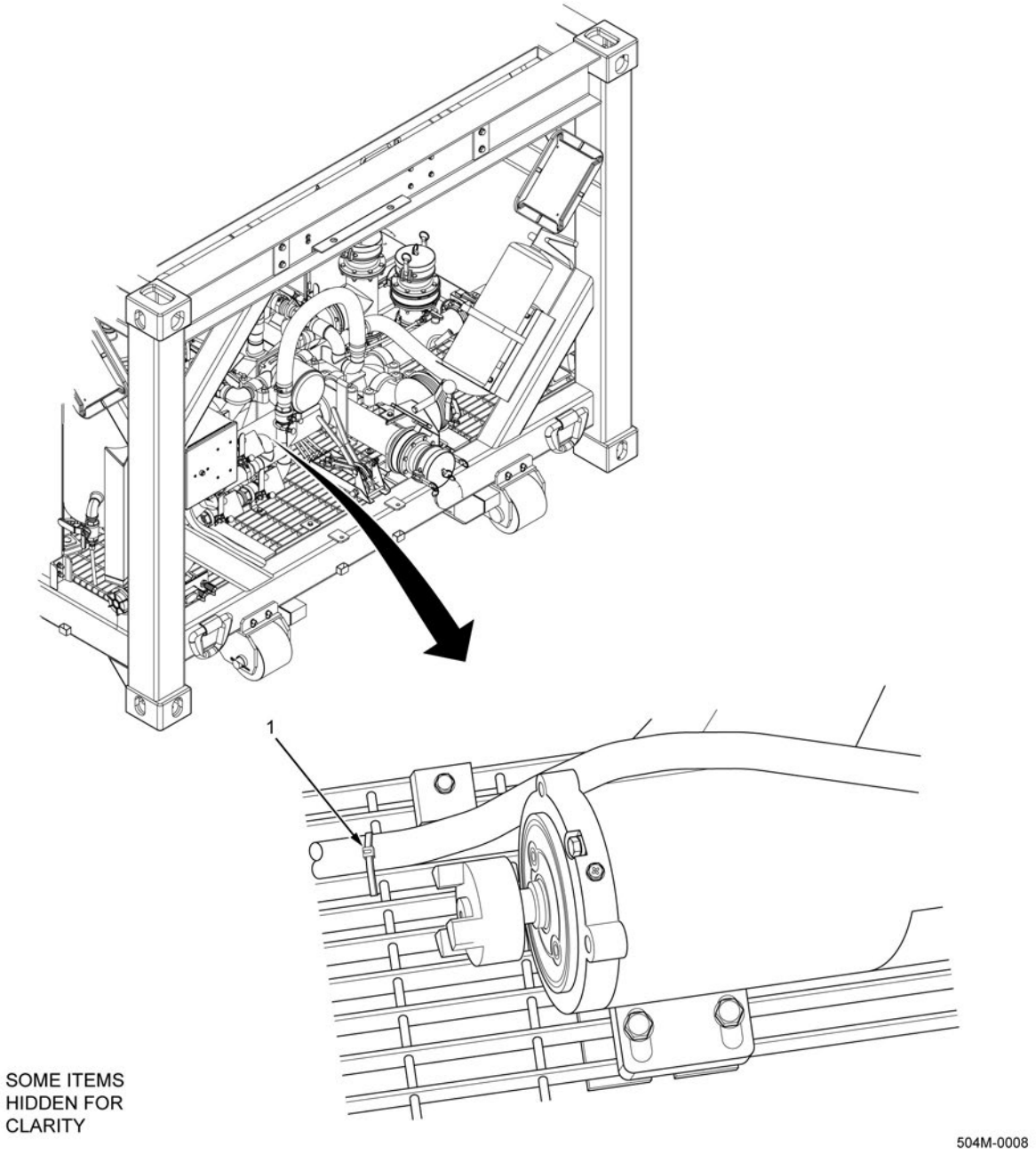


Figure 2. Cable Tie.

4. Remove four locknuts (Figure 3, Items 3), flat washers (Figure 3, Items 2), and grating clasps (Figure 3, Item 1). Discard locknuts.

REMOVAL - Continued

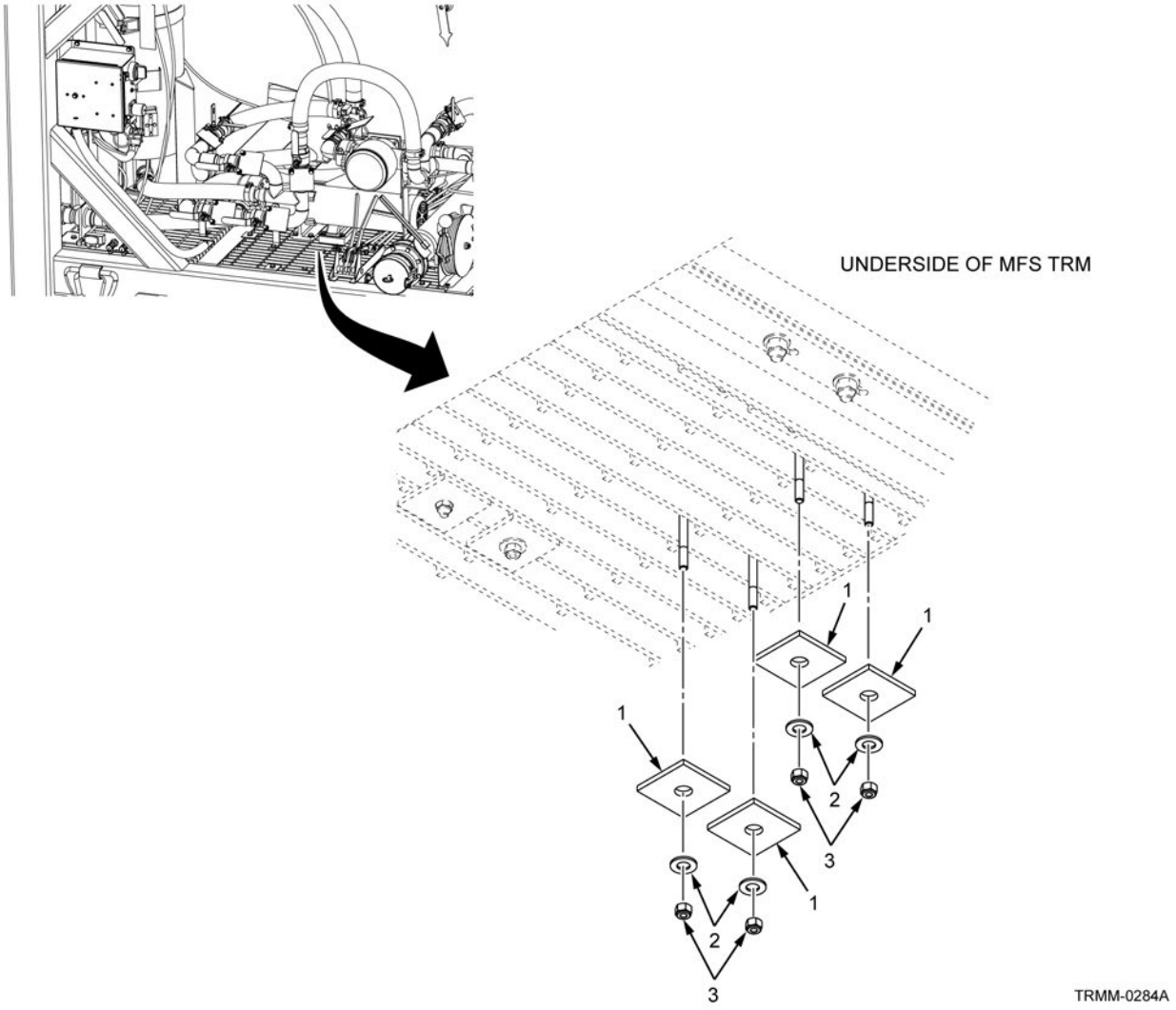


Figure 3. Removing Attaching Hardware.

5. Remove four bolts (Figure 4, Item 1) and flat washers (Figure 4, Item 2) and remove spacer (Figure 4, Item 3).
6. Loosen setscrew (Figure 4, Item 4) and remove lovejoy coupling (Figure 4, Item 5). Retain for installation.

REMOVAL - Continued

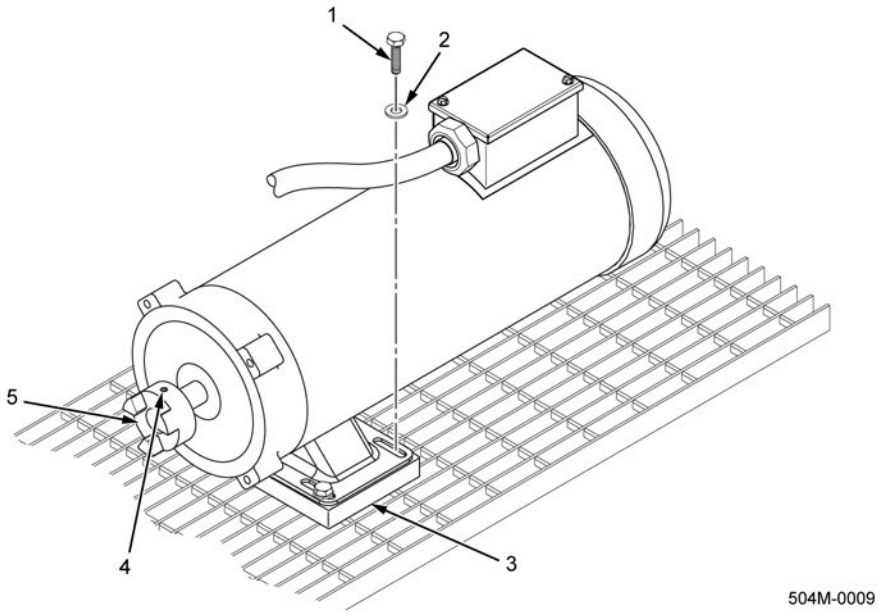


Figure 4. Removing Electric Motor.

REMOVAL - Continued

7. Remove two screws (Figure 5, Item 1) and remove conduit box cover (Figure 5, Item 2).

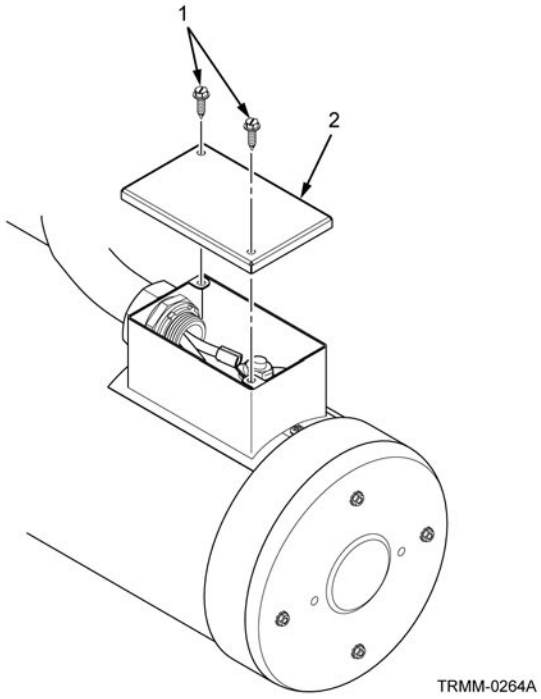


Figure 5. Removing Conduit Box Cover.

REMOVAL - Continued

8. Remove two nuts (Figure 6, Item 2) and flat washers (Figure 6, Item 3) and disconnect red and black power wires (Figure 6, Items 1 and 5).
9. Remove conduit nut (Figure 6, Item 6).
10. Remove power wires (Figure 6, Items 1 and 5) from conduit box (Figure 6, Item 4).

WARNING

Electric Motor weighs in excess of 40 pounds. Lifting electric motor improperly can injure personnel. Use two personnel to lift electric motor out of MFS TRM. Failure to comply can result in injury to personnel.

11. Remove electric motor (Figure 6, Item 7) from MFS TRM.

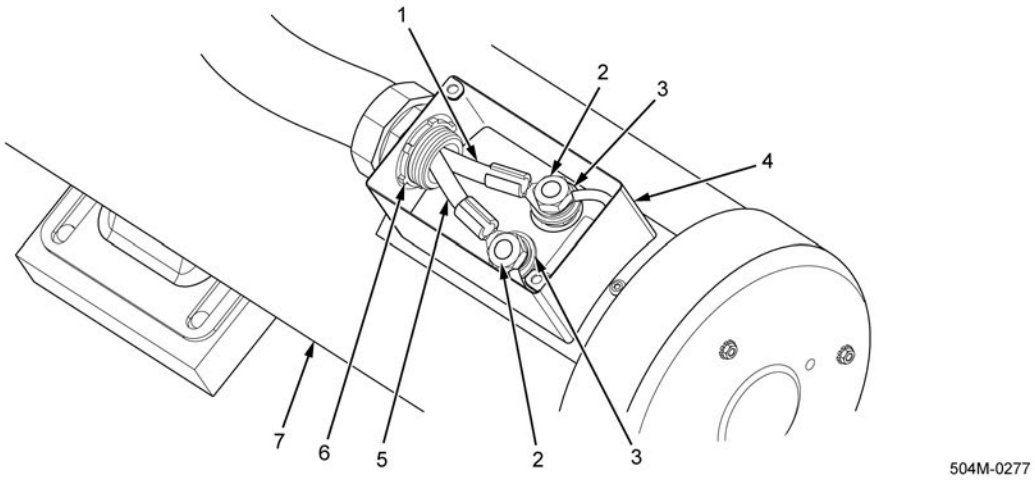


Figure 6. Disconnecting Electric Motor.

END OF TASK

INSTALLATION

1. Install lovejoy coupling (Figure 7, Item 3) on electric motor shaft (Figure 7, Item 2). Do not tighten setscrew (Figure 7, Item 2).

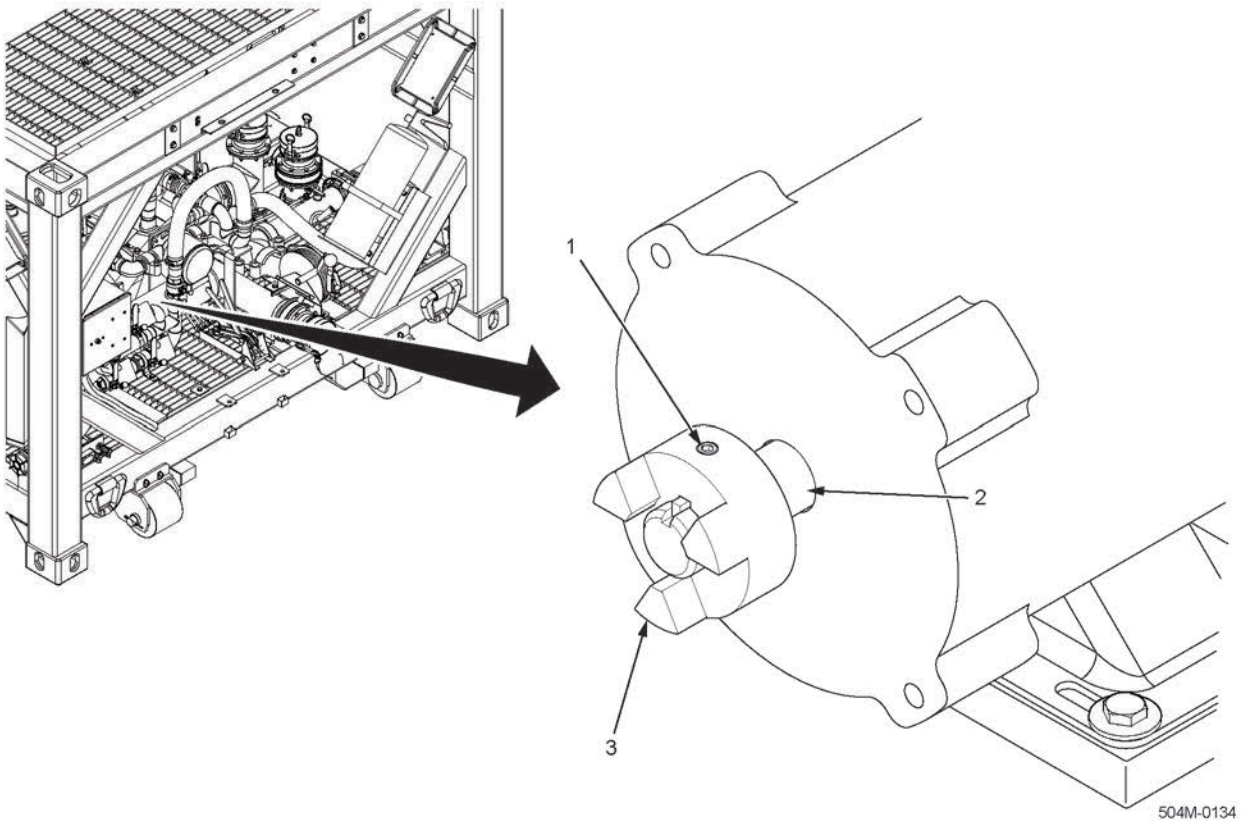


Figure 7. Electric Motor Lovejoy Coupling.

2. Remove two screws (Figure 8, Item 1) and remove conduit box cover (Figure 8, Item 2) from new electric motor.

INSTALLATION - Continued

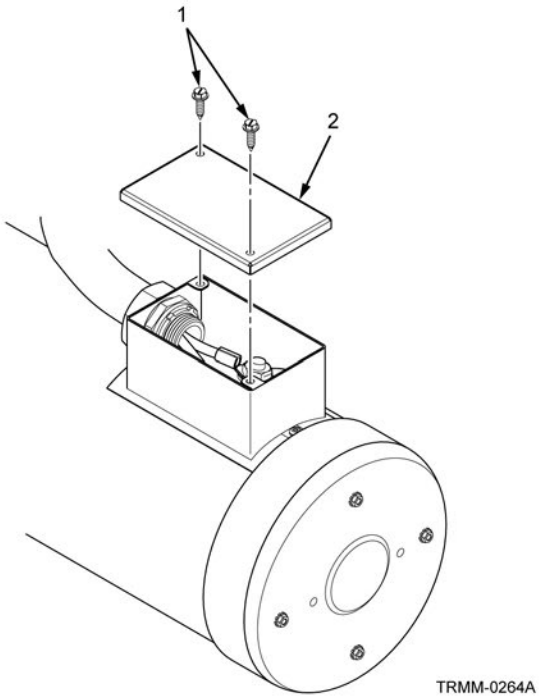


Figure 8. Removing Conduit Cover.

INSTALLATION - Continued

3. Ensure conduit washer (Figure 9, Item 7) is on cable assembly prior to inserting power wires (Figure 9, Items 1 and 5) into conduit box (Figure 9, Item 4).
4. Insert power wires (Figure 9, Items 1 and 5) through conduit nut (Figure 9, Item 6) into conduit box (Figure 9, Item 4).
5. Install conduit nut (Figure 9, Item 6).
6. Secure red power wire (Figure 9, Item 1) to positive (+) terminal using flat washer (Figure 9, Item 3) and nut (Figure 9, Item 2).
7. Secure black wire (Figure 9, Item 5) to negative (-) terminal using flat washer (Figure 9, Item 3) and nut (Figure 9, Item 2).

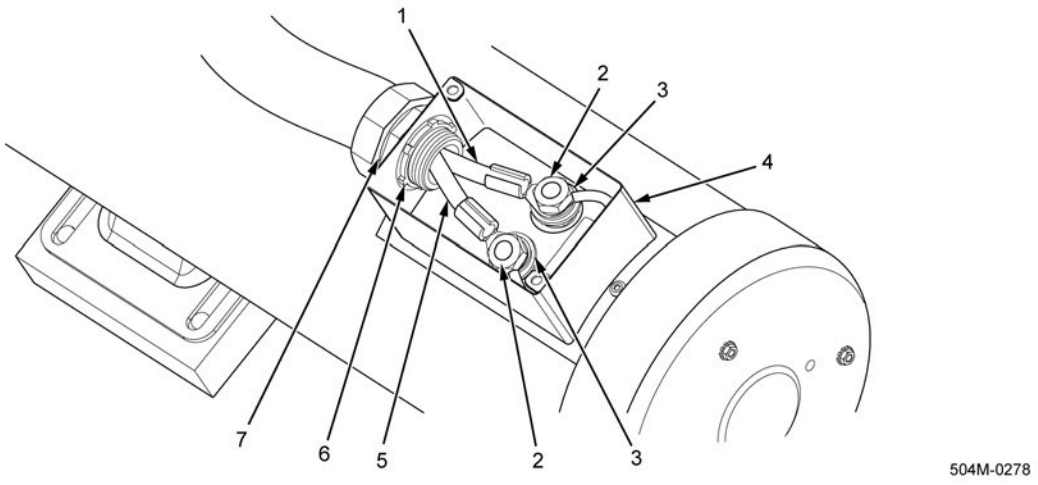


Figure 9. Installing Electric Motor.

INSTALLATION - Continued

8. Install conduit box cover (Figure 10, Item 2) and secure with two screws (Figure 10, Item 1).

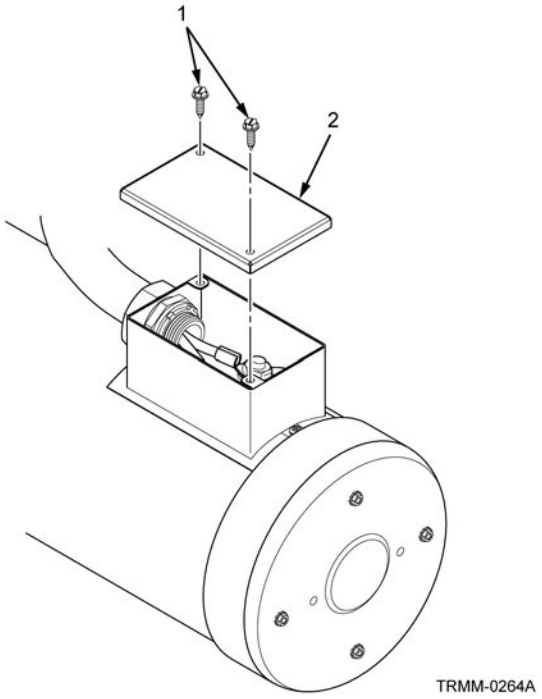


Figure 10. Replacing Conduit Box Cover.

INSTALLATION - Continued

9. Set electric motor (Figure 11, Item 1) into place on grating and install spacer (Figure 11, Item 4).
10. Install four bolts (Figure 11, Item 2) and flat washers (Figure 11, Item 3) through mounting holes in electric motor (Figure 11, Item 1) and spacer (Figure 11, Item 4).

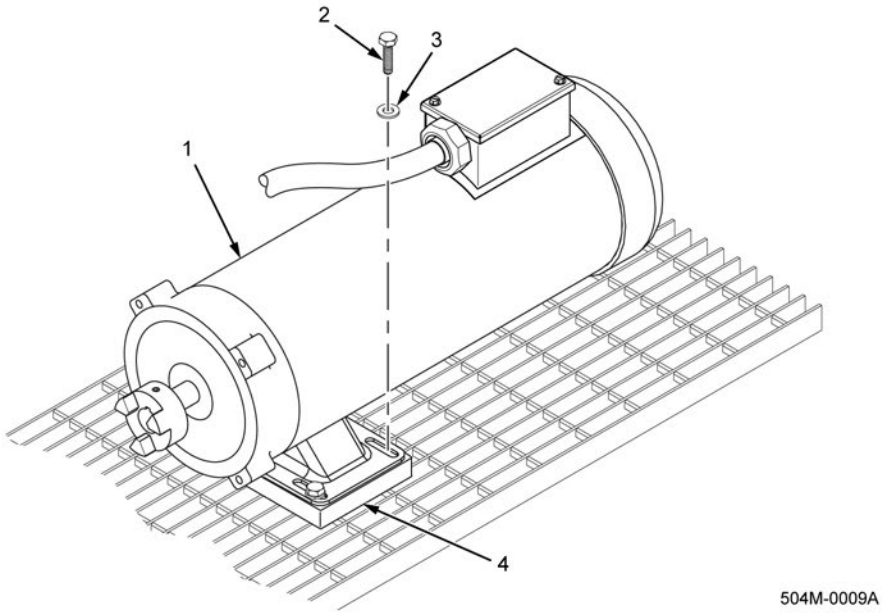


Figure 11. Replacing Electric Motor.

NOTE

Do not tighten locknuts in the following step. These locknuts will be tightened during the pump assembly installation procedure (WP 0080).

11. Install four grating clasps (Figure 12, Item 1) and loosely secure in place with flat washers (Figure 12, Item 2) and new locknuts (Figure 12, Item 3).

INSTALLATION - Continued

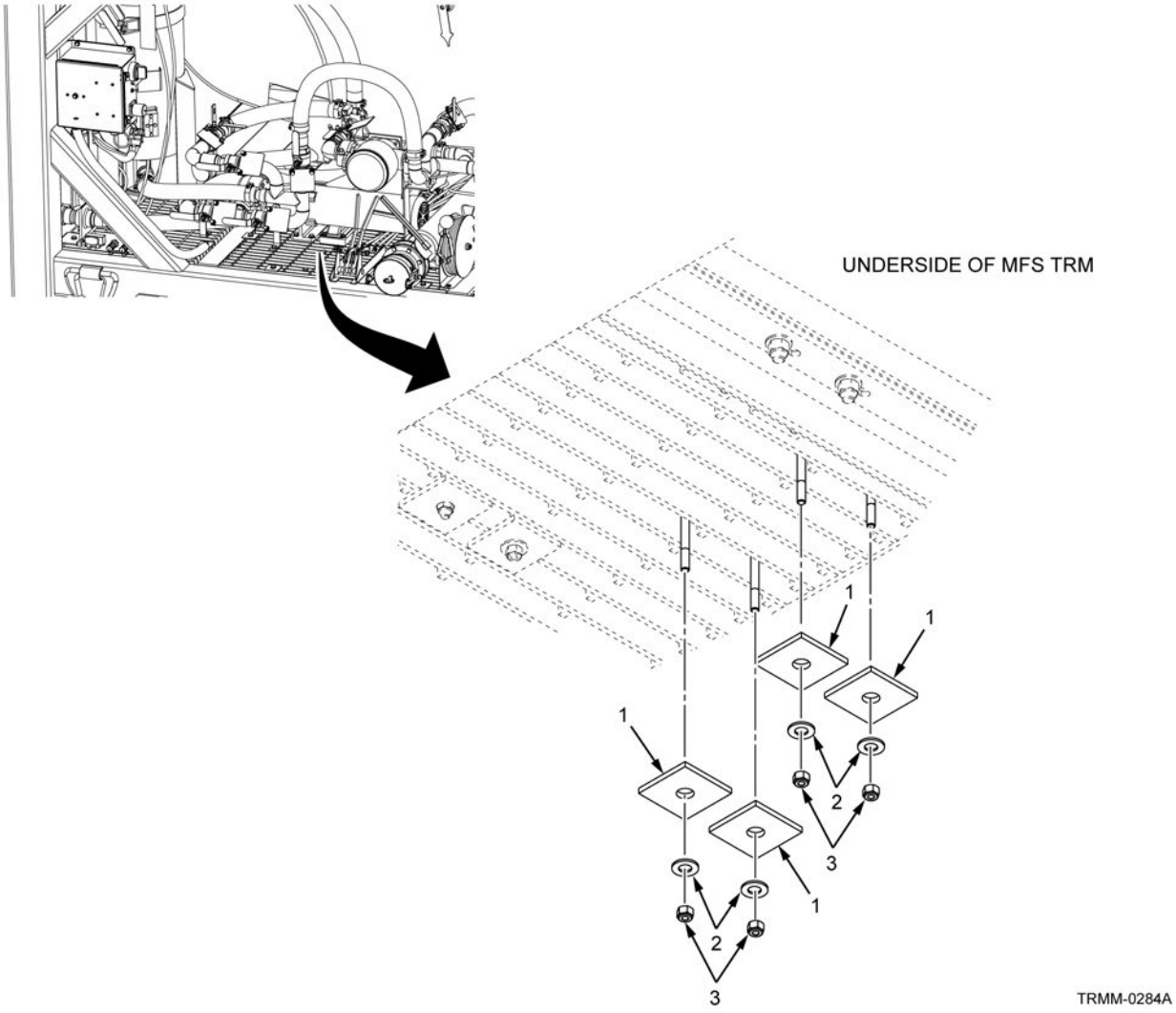


Figure 12. Attaching Electric Motor Mounting Hardware.

INSTALLATION - Continued

12. Install new cable tie (Figure 13, Item 1).

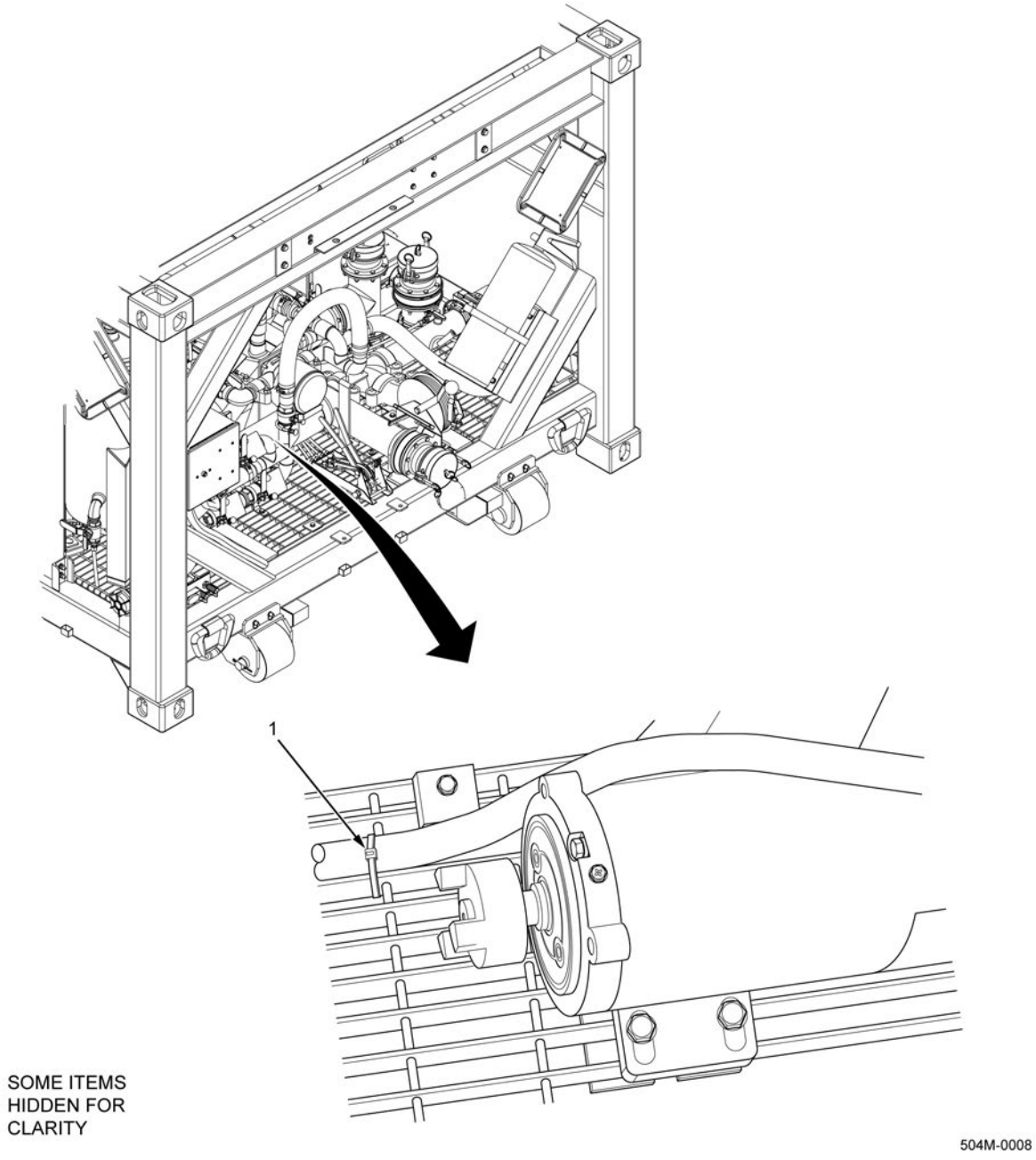


Figure 13. Cable Tie.

INSTALLATION - Continued

13. Close both (V1) (Figure 14, Item 2) and (V2) (Figure 14, Item 1) valves which were opened during removal.

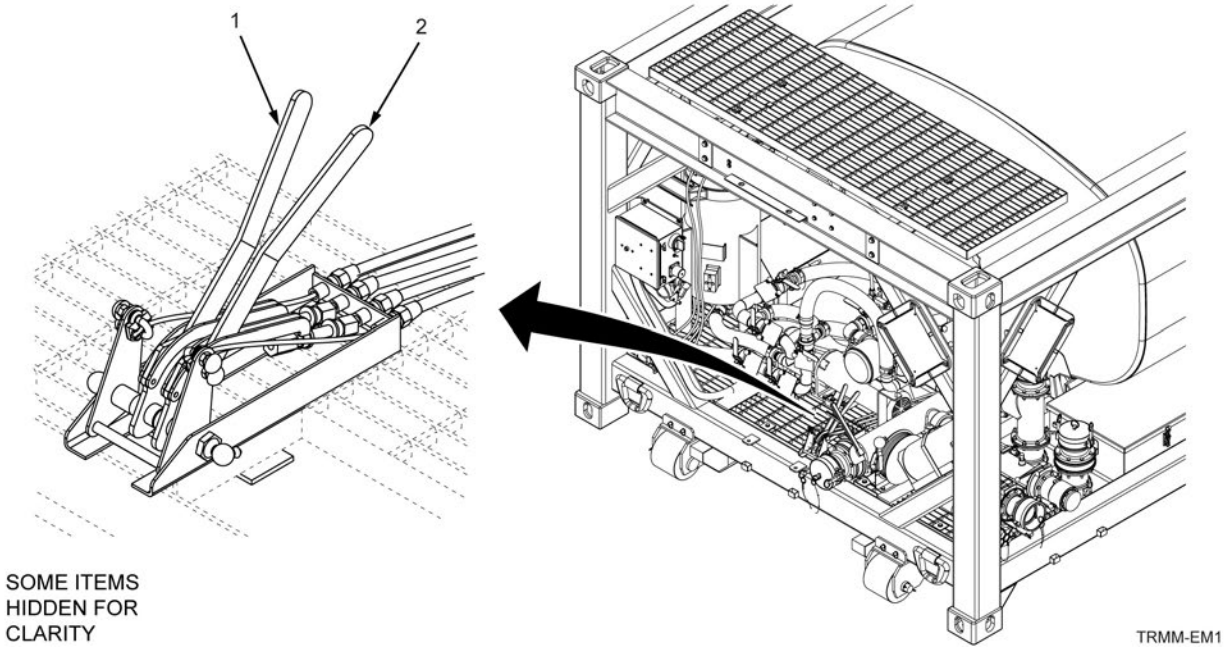


Figure 14. Valve Control Levers.

END OF TASK

FOLLOW-ON MAINTENANCE

Install pump assembly (WP 0080).

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
PUMP ASSEMBLY REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposable nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)
- Pan, drip (WP 0217, Table 1, Item 8)
- Pliers, multiple position (WP 0217, Table 1, Item 9)
- Vise, machinist's (WP 0217, Table 1, Item 14)
- Wire brush (WP 0217, Table 1, Item 15)
- Wrench, internal pipe (WP 0217, Table 1, Item 18)
- Wrench, pipe, 18 inch (WP 0217, Table 1, Item 19)

Materials/Parts
- Absorbent material (WP 0216, Table 1, Item 1)
- Cleaning compound, solvent (WP 0216, Table 1, Item 3)
- Cloth, cleaning (WP 0216, Table 1, Item 4)
- Sealing compound (WP 0216, Table 1, Item 13)
- Thread sealing compound (WP 0216, Table 1, Item 15)
- Coupling spider, HYT (WP 0173, Figure 27, Item 7)

Materials/Parts (cont.)
- Nut, self-locking, hexagon (LOCKNUTS) Qty: 4 (WP 0173, Figure 27, Item 12)
- Washer, lock, internal tooth Qty: 2 (WP 0173, Figure 27, Item 10)
- Washer, lock Qty: 4 (WP 0173, Figure 27, Item 14)
- Pump assembly (WP 0173, Figure 27, Item 17)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer (2)

References
- ATP 4-43
- TM 10-4930-371-10

Equipment Condition
- MFS TRM grounded (TM 10-4930-371-10)
- MFS TRM drained (TM 10-4930-371-10)
- MFS TRM shut down (TM 10-4930-371-10)

Time to Complete
- 2.5 Hour(s)

REMOVAL

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Use a drip pan to collect leaking fuel. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.

WARNING

The MFS TRM has 18-30 VDC voltage present at electrical connections. Electrical shock can cause injury or death to personnel. When replacing or servicing any electrical component, disconnect power cable. Failure to comply could result in injury or death to personnel.

NOTE

Note orientation of hardware and components to aid in installation.

1. Remove vapor recovery line dust cap (Figure 1, Item 2).
2. Momentarily open then close (V1) bottom loading valve (Figure 1, Item 1) to vent tank pressure.

REMOVAL - Continued

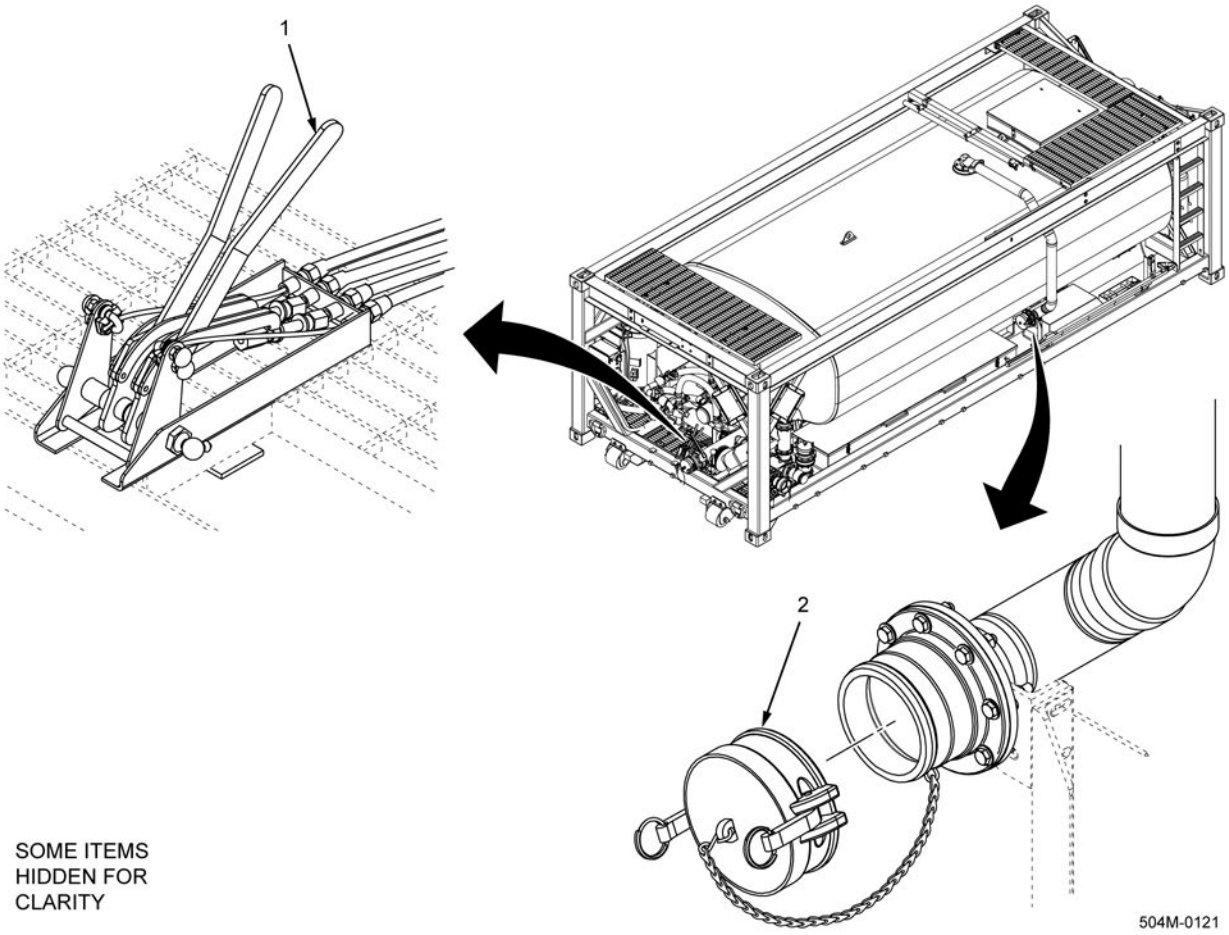


Figure 1. Fuel System Venting.

3. Ensure power is disconnected from MFS TRM.
4. Set ball valves (V9) (Figure 2, Item 4), (V10) (Figure 2, Item 3), (V11) (Figure 2, Item 1), and (V15) (Figure 2, Item 2) to open position.

REMOVAL - Continued

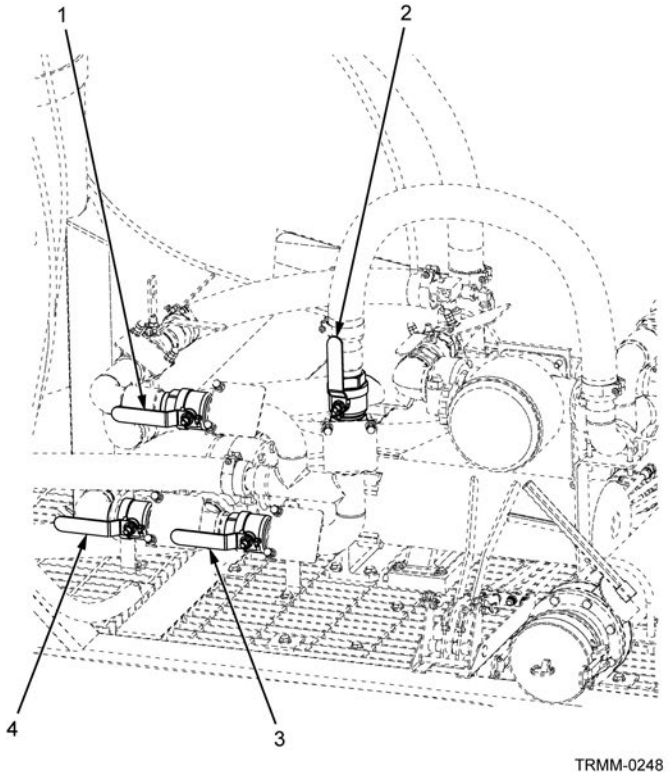


Figure 2. Opening Ball Valves.

5. Place drip pan under pump assembly (Figure 3, Item 8) to catch any residual fuel.
6. Remove hose clamp (Figure 3, Item 10) and disconnect hose (Figure 3, Item 1) from hose barb (Figure 3, Item 9).
7. Remove two nuts (Figure 3, Item 2), and bolts (Figure 3, Item 6) and remove coupling halves (Figure 3, Item 3) securing pump assembly (Figure 3, Item 8) to tee (Figure 3, Item 5).
8. Slide coupling gasket (Figure 3, Item 4) onto nipple (Figure 3, Item 7).

REMOVAL - Continued

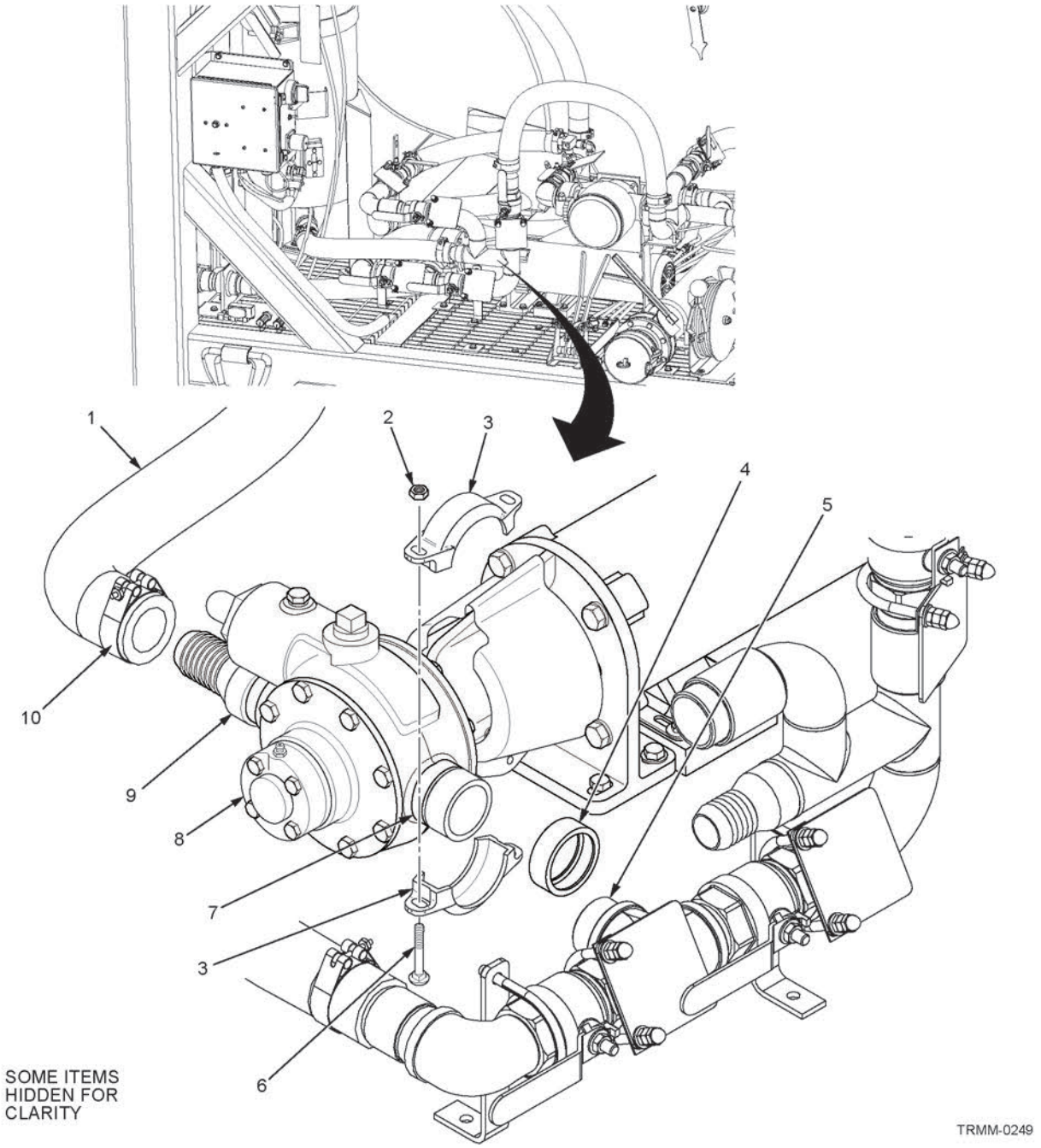


Figure 3. Disconnecting Pump Assembly Connections.

9. Remove screw (Figure 4, Item 2) and remove coupling guard (Figure 4, Item 1).

REMOVAL - Continued

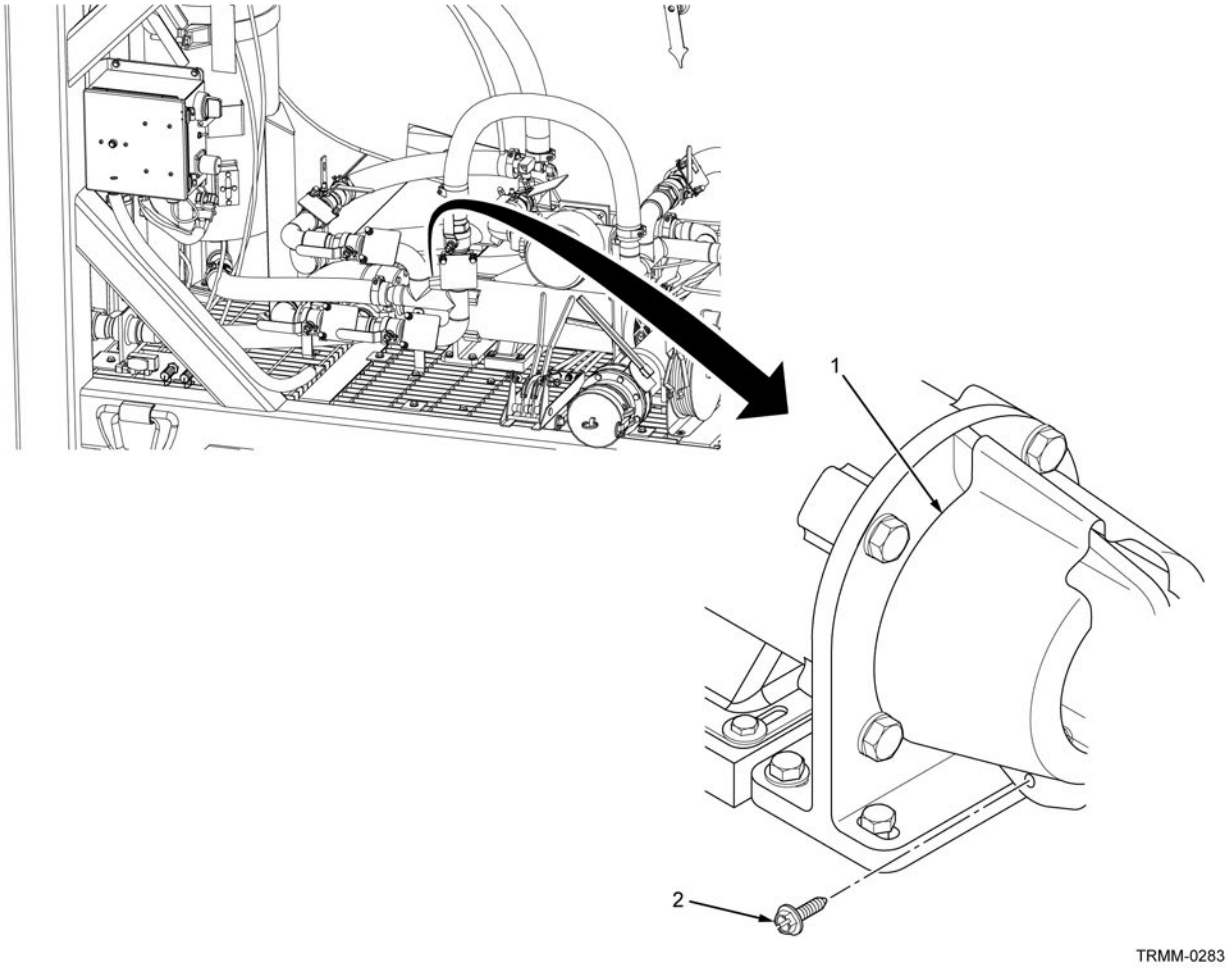


Figure 4. Removing Coupling Guard.

10. Remove four bolts (Figure 5, Item 1) and lock washers (Figure 5, Item 2) securing pump assembly (Figure 5, Item 3) to electric motor (Figure 5, Item 8). Discard lock washers.

NOTE

The locknut removed in the following step secures a ground strap. Ground strap should remain attached at other end.

11. Remove bolt (Figure 5, Item 6) and two internal lock washers (Figure 5, Item 15), releasing ground strap (Figure 5, Item 14). Discard internal lock washers.
12. Remove three bolts (Figure 5, Item 6), six flat washers (Figure 5, Item 7), three locknuts (Figure 5, Item 13), and backup plate (Figure 5, Item 12). Discard locknuts.
13. Loosen four bolts (Figure 5, Item 9) securing electric motor (Figure 5, Item 8) to grate (Figure 5, Item 16).

REMOVAL - Continued

WARNING

Pump assembly weighs in excess of 40 pounds. Lifting pump assembly improperly can injure personnel. Use two personnel to lift pump assembly. Failure to comply can result in injury to personnel.

14. Separate pump assembly (Figure 5, Item 3) from electric motor (Figure 5, Item 8) and remove pump assembly (Figure 5, Item 3).
15. Remove spider coupling (Figure 5, Item 11) from lovejoy coupling (Figure 5, Item 10). Discard spider coupling.
16. Loosen setscrew (Figure 5, Item 4) and remove lovejoy coupling (Figure 5, Item 5) from pump (Figure 5, Item 8). Retain lovejoy coupling for installation.

REMOVAL - Continued

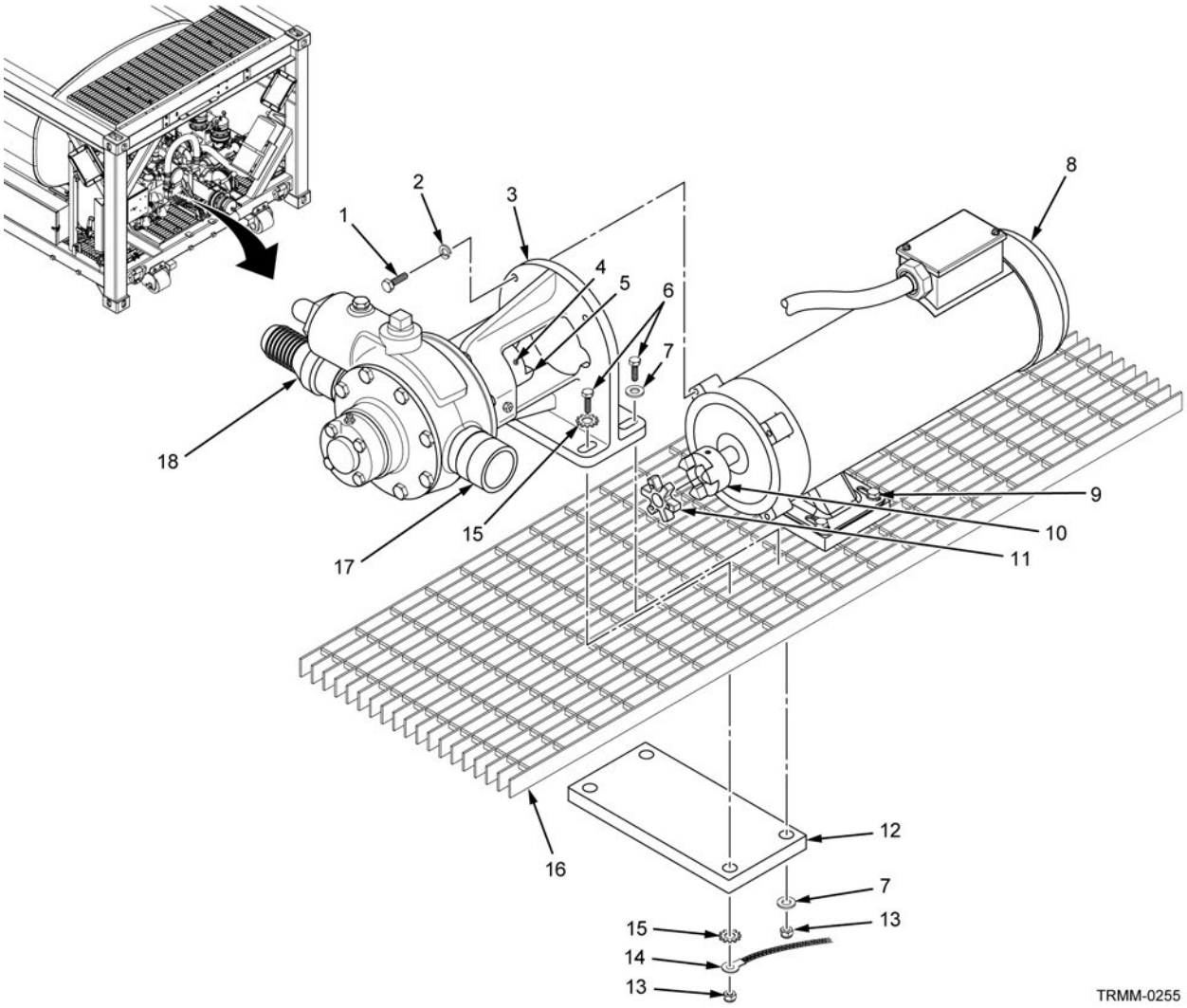


Figure 5. Pump Assembly.

17. Remove and discard coupling gasket (Figure 6, Item 1).
18. Place pump assembly in vise.
19. Remove nipple (Figure 5, Item 17) from pump assembly and retain for installation.
20. Remove hose barb (Figure 5, Item 18) from pump assembly and retain for installation.
21. Discard residual fuel from drip pan IAW unit SOP.

END OF TASK

CLEANING

WARNING

Solvent cleaning compound MIL-PRF-680 Type III is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Keep away from open flames and other sources of ignition. Failure to comply may cause injury to personnel.

1. Clean all threads. Remove all buildup of dirt, oil, and debris from threads.
2. Clean all metal parts with a cleaning cloth and solvent cleaning compound.
3. Allow all parts to dry thoroughly.

END OF TASK

INSTALLATION

1. Place pump assembly in vise.

WARNING

Thread sealing compound is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Failure to comply may cause injury to personnel.

2. Apply thread sealing compound to all threads.
3. Install hose barb (Figure 5, Item 18) on pump assembly.
4. Install nipple (Figure 5, Item 17) on pump assembly.
5. Lightly lubricate new coupling gasket (Figure 6, Item 1) with fuel.
6. Install coupling gasket (Figure 6, Item 1) on tee (Figure 6, Item 2).

INSTALLATION - Continued

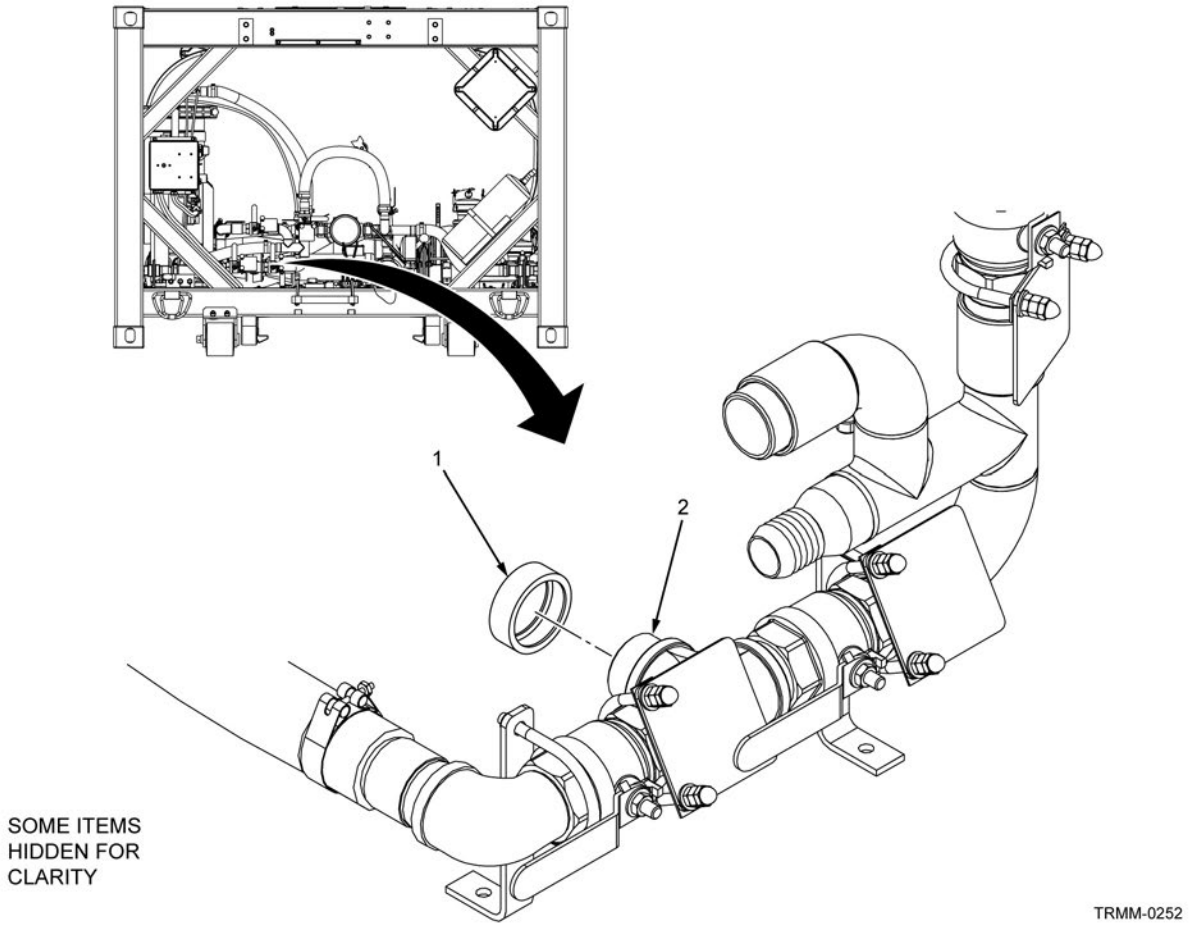


Figure 6. Coupling Gasket.

7. If the pump was removed and replaced with a new pump, install the lovejoy coupling (Figure 7, Item 3) on new pump assembly (Figure 7, Item 1) so that it is flush with end of pump assembly shaft.
8. If the pump was removed to replace the motor and was not replaced, complete the following steps:

   If the lovejoy coupling is not flush with pump assembly shaft, adjust as follows:

   (1) Loosen set screw (Figure 7, Item 2) on lovejoy coupling (Figure 7, Item 3) and slide lovejoy coupling toward end of shaft.

   (2) Tighten set screw (Figure 7, Item 2).

INSTALLATION - Continued

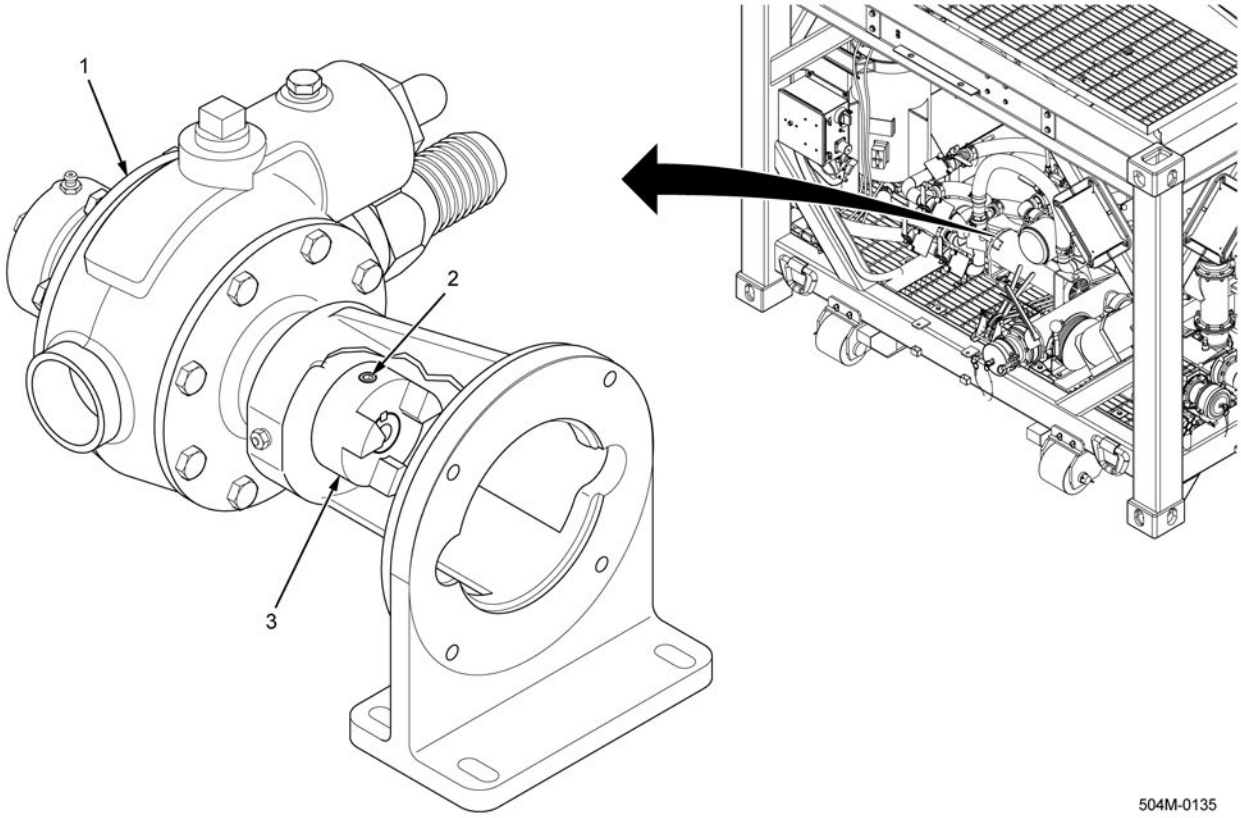


Figure 7. Pump Assembly Lovejoy Coupling.

9. Install new spider coupling (Figure 8, Item 6) on electric motor half of lovejoy coupling (Figure 8, Item 5).

WARNING

Pump assembly weighs in excess of 40 pounds. Lifting pump assembly improperly can injure personnel. Use two personnel to lift pump assembly. Failure to comply can result in injury to personnel.

10. Position new pump assembly (Figure 8, Item 3) on electric motor (Figure 8, Item 4).
11. Install four bolts (Figure 8, Item 1) and four new lock washers (Figure 8, Item 2) to secure pump assembly (Figure 8, Item 3) to electric motor (Figure 8, Item 4).

INSTALLATION - Continued

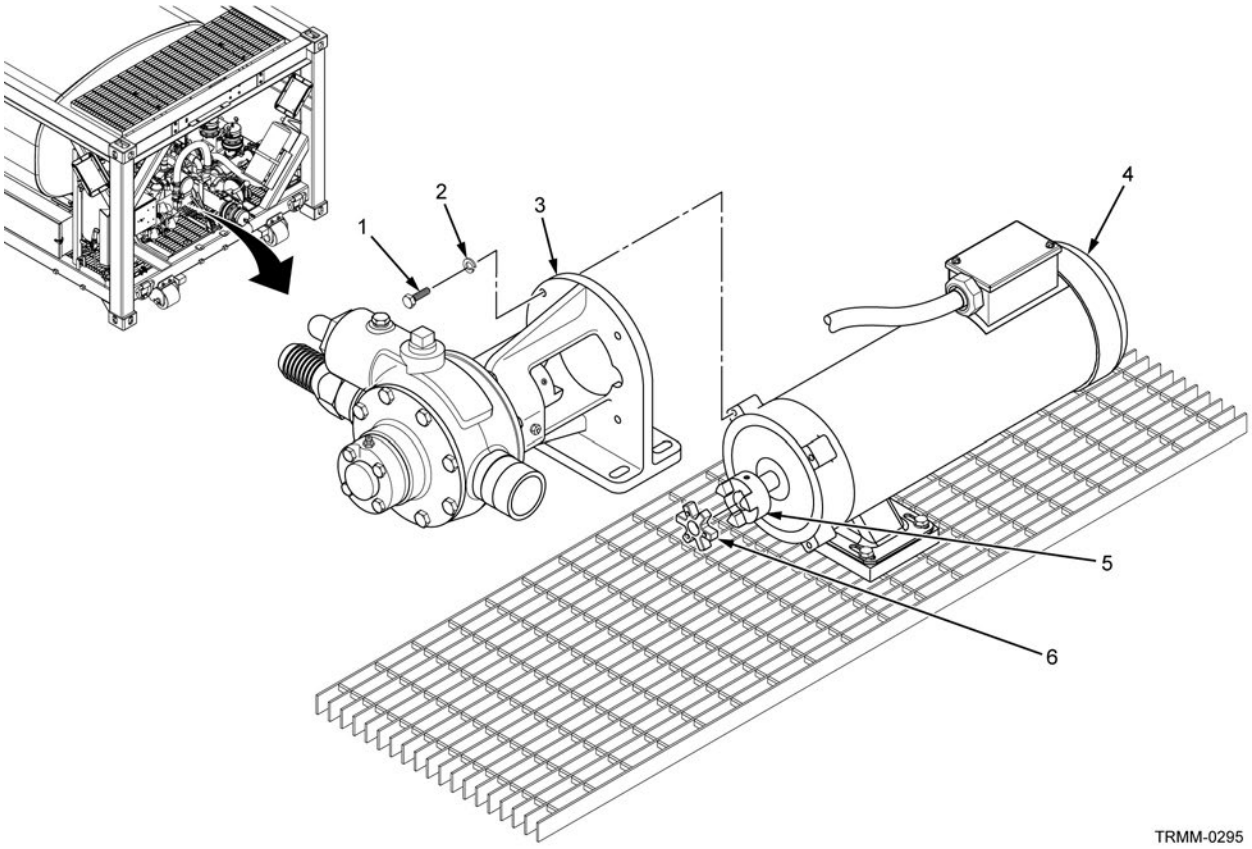


Figure 8. Installing Pump Assembly.

12. Slide lovejoy coupling (Figure 9, Item 3) on electric motor (Figure 9, Item 4) toward the lovejoy coupling (Figure 9, Item 2) on pump assembly (Figure 9, Item 1) until gap between the lovejoy coupling halves is approximately 0.032 inches.

INSTALLATION - Continued

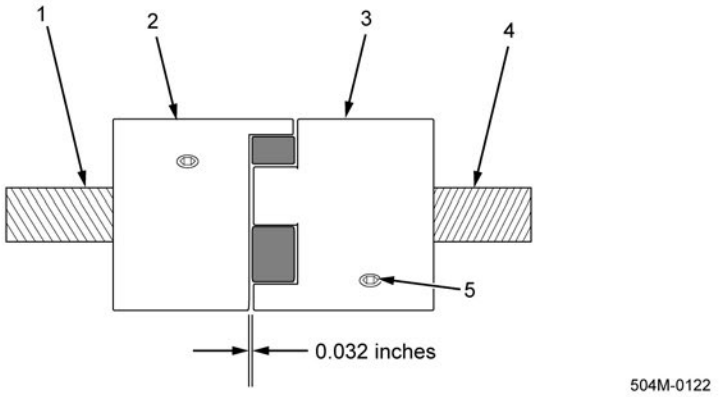


Figure 9. Engaging Lovejoy Couplings.

13. Tighten set screw (Figure 9, Items 5) on lovejoy coupling (Figure 9, Item 3).

INSTALLATION - Continued

14. Slide coupling gasket (Figure 10, Item 4) into place between tee (Figure 10, Item 5) and coupling adapter (Figure 10, Item 7) on pump assembly (Figure 10, Item 8).
15. Install coupling halves (Figure 10, Item 3), and loosely secure with two nuts (Figure 10, Item 2) and two bolts (Figure 10, Item 6).
16. Ensure coupling gasket (Figure 10, Item 4) is centered between tee (Figure 10, Item 5) and coupling adapter (Figure 10, Item 7).
17. Tighten two nuts (Figure 10, Item 2) and two bolts (Figure 10, Item 6) until coupling halves (Figure 10, Item 3) are contacting each other on each side.

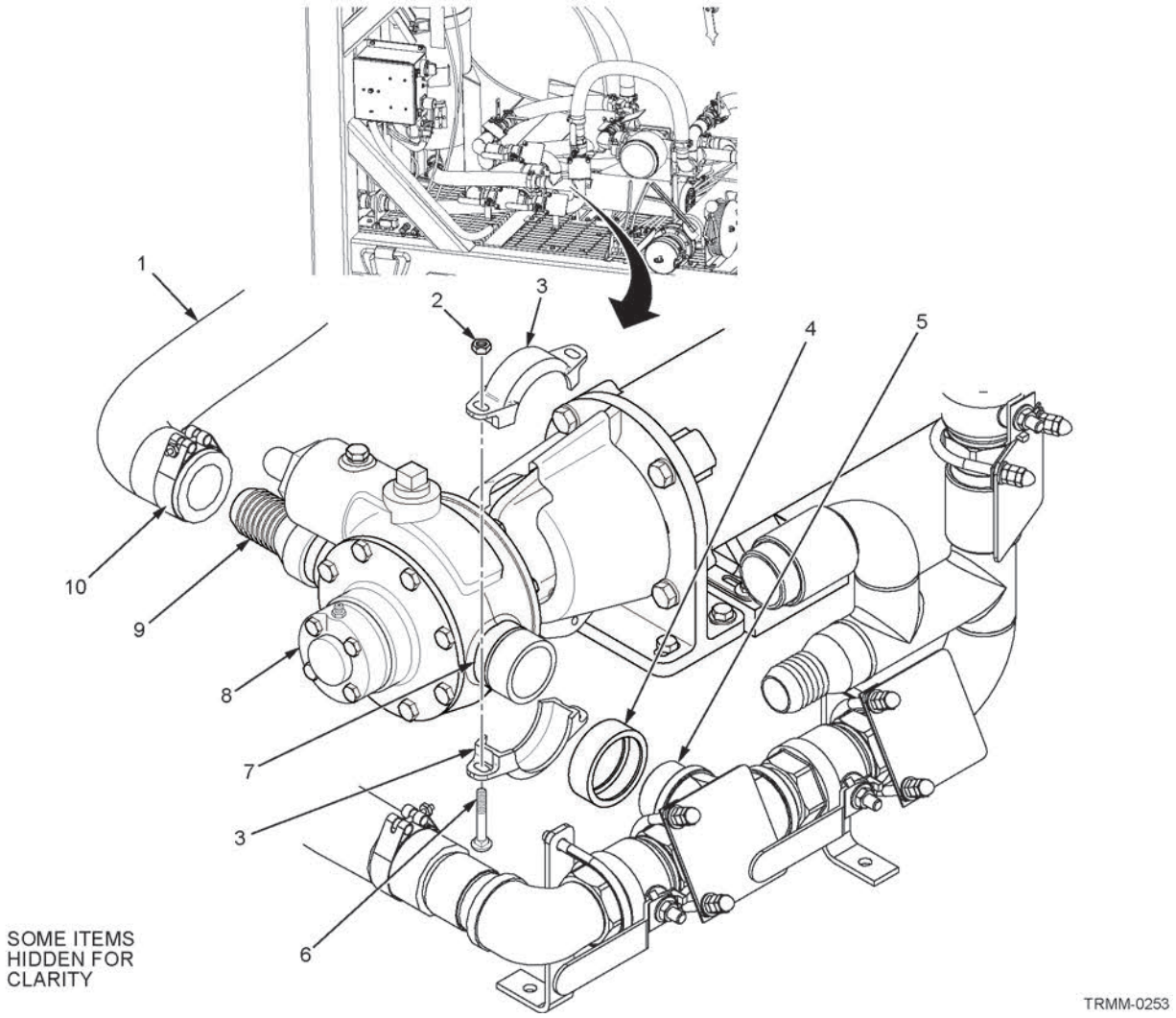


Figure 10. Attaching Pump Assembly Connections.

18. Install four bolts (Figure 11, Item 1) and four flat washers (Figure 11, Item 2).
19. Install backup plate (Figure 11, Item 9) with three flat washers (Figure 11, Item 5) and three new locknuts (Figure 11, Item 6).

INSTALLATION - Continued

20. Attach ground strap (Figure 11, Item 7) and new internal lock washer (Figure 11, Item 8) onto bolt (Figure 11, Item 1) and secure with new locknut (Figure 11, Item 6).
21. Tighten four locknuts (Figure 11, Item 4) to secure electric motor (Figure 11, Item 3) to grate.
22. Connect hose (Figure 10, Item 1) to hose barb (Figure 10, Item 9) and secure with hose clamp (Figure 10, Item 10).

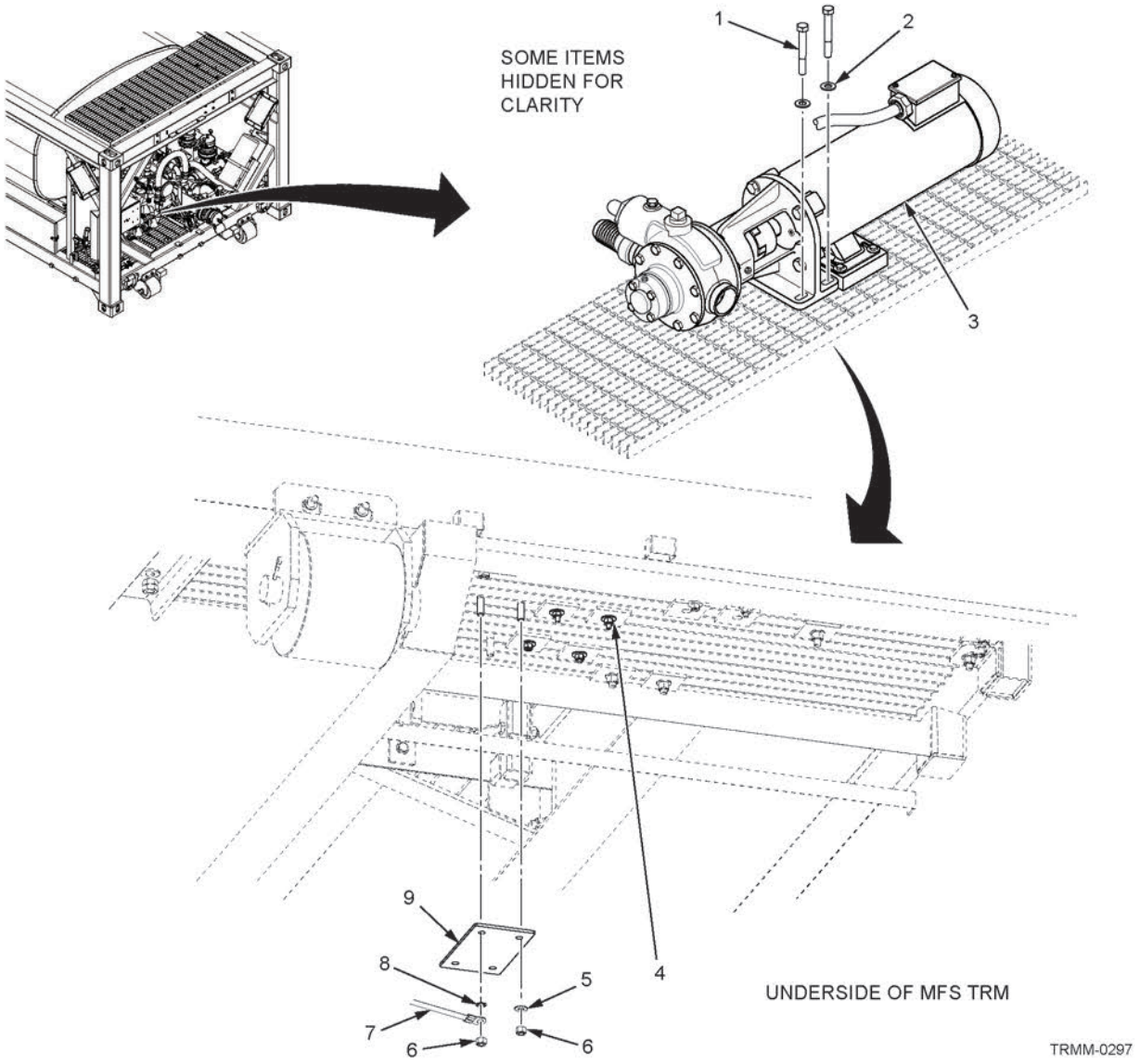


Figure 11. Installing Pump Mounting Bolts.

INSTALLATION - Continued

23. Install coupling guard (Figure 12, Item 1) and secure with screw (Figure 12, Item 2).
24. Set ball valves (V9) (Figure 13, Item 4), (V10) (Figure 13, Item 3), (V11) (Figure 13, Item 1), and (V15) (Figure 13, Item 2) to closed position.

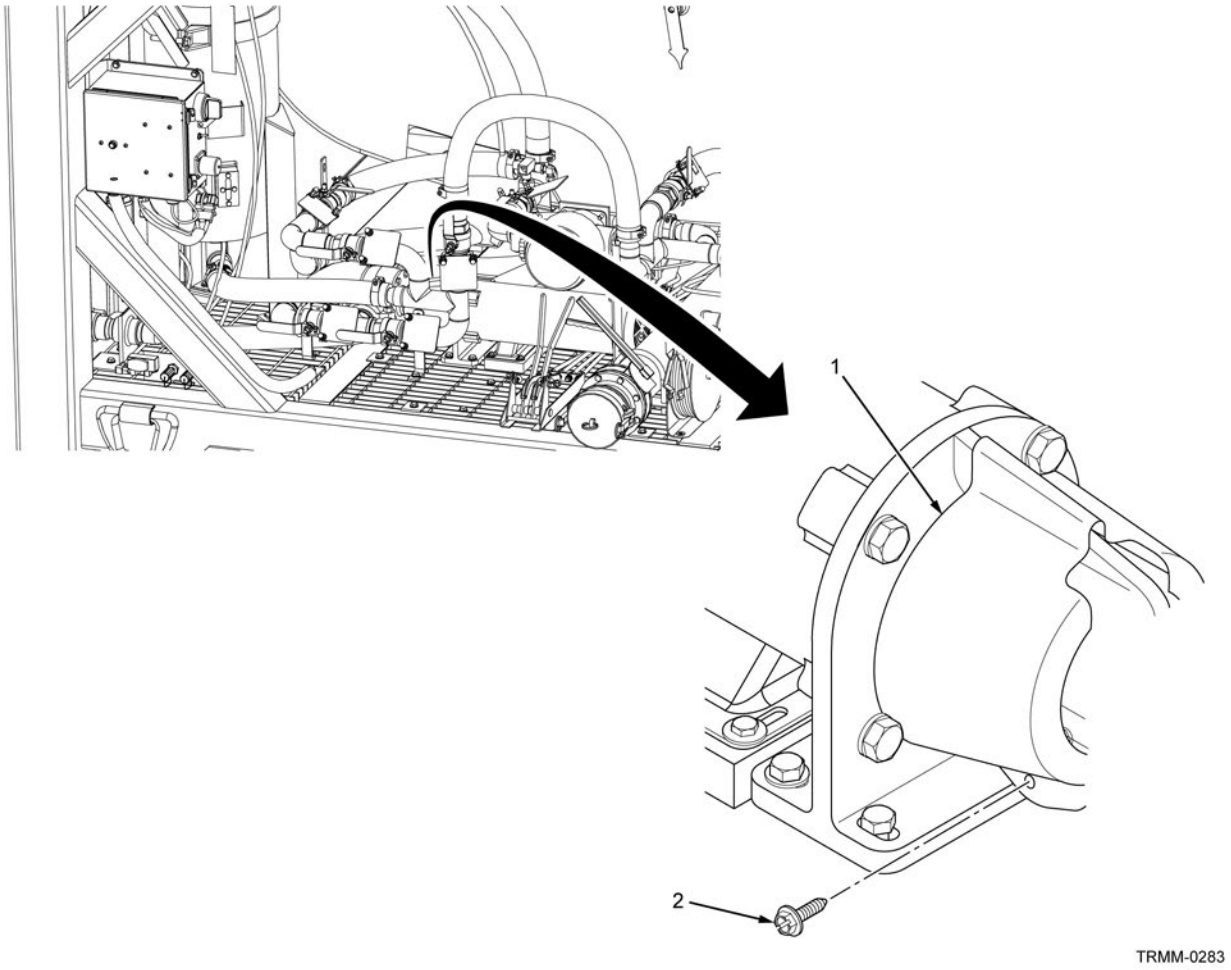


Figure 12. Replacing Coupling Guard.

INSTALLATION - Continued

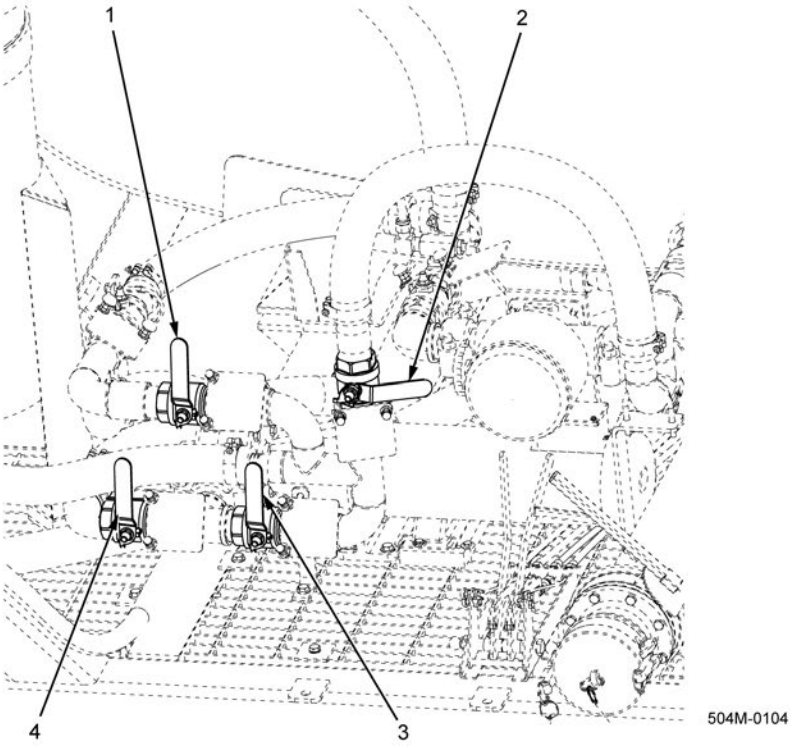


Figure 13. Closing Ball Valves.

25. Install vapor recovery pipe dust cap (Figure 14, Item 1).

INSTALLATION - Continued

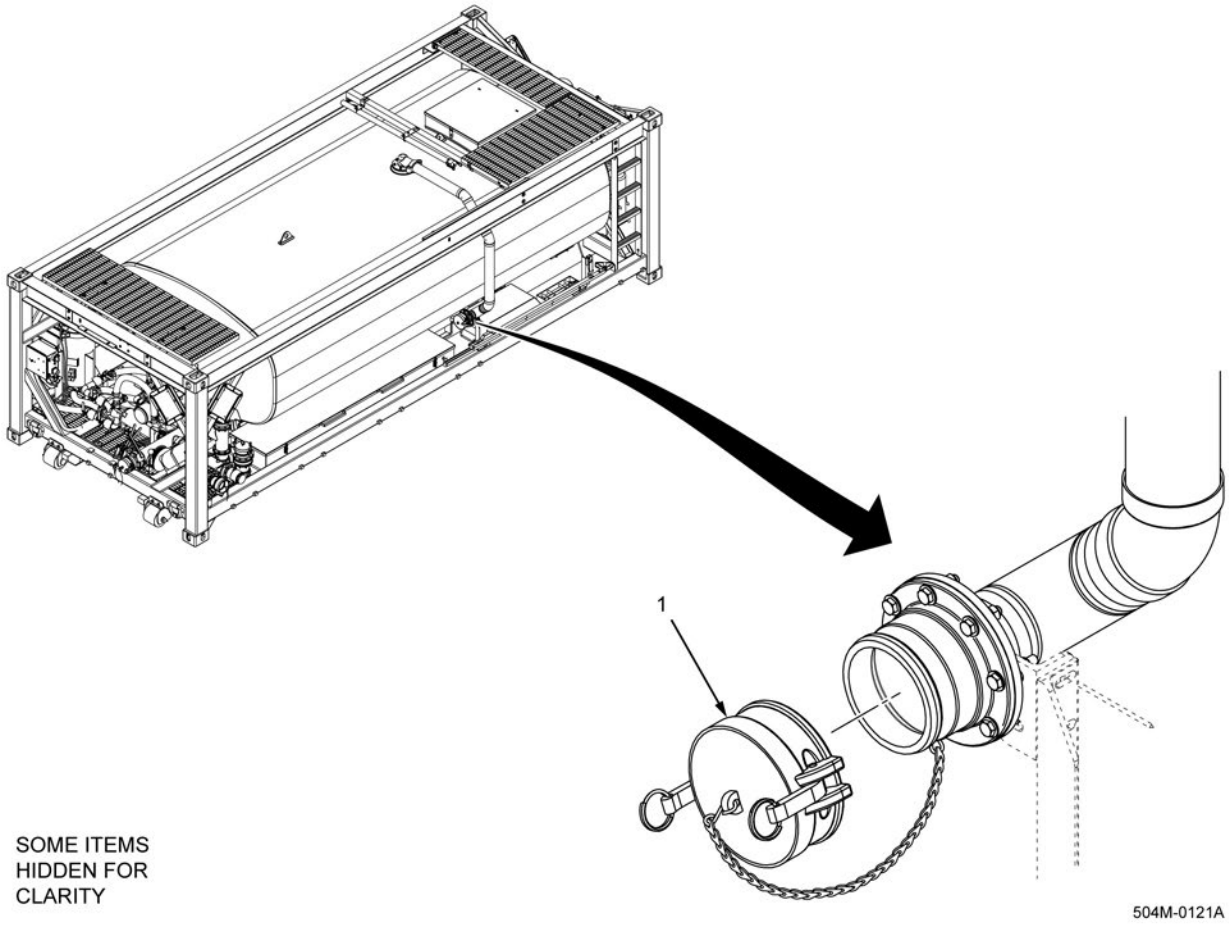


Figure 14. Installing Vapor Recovery Line Dust Cap.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Set up MFS TRM (TM 10-4930-371-10).
2. Check MFS TRM for leaks by recirculating fuel (TM 10-4930-371-10).

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
VALVE ADAPTER ASSEMBLY REPAIR

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposable nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)
- Pan, drip (WP 0217, Table 1, Item 8)
- Vise, machinist's (WP 0217, Table 1, Item 14)
- Wrench, torque, click, ratcheting, 3/8 inch drive, 20 to 100 lb-ft. (WP 0217, Table 1, Item 23)

Materials/Parts
- Absorbent material (WP 0216, Table 1, Item 1)
- Cleaning compound, solvent (WP 0216, Table 1, Item 3)
- Cloth, cleaning (WP 0216, Table 1, Item 4)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer

References
- ATP 4-43

Equipment Condition
- MFS TRM grounded (TM 10-4930-371-10)

Time to Complete
- 1 Hour(s)

REMOVAL

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Use a drip pan to collect leaking fuel. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.

1. Unhook s-hook (Figure 1, Item 2) from split ring on lever (Figure 1, Item 1).
2. Open levers (Figure 1, Item 1) and remove valve adapter (Figure 1, Item 3) from MFS TRM.

REMOVAL - Continued

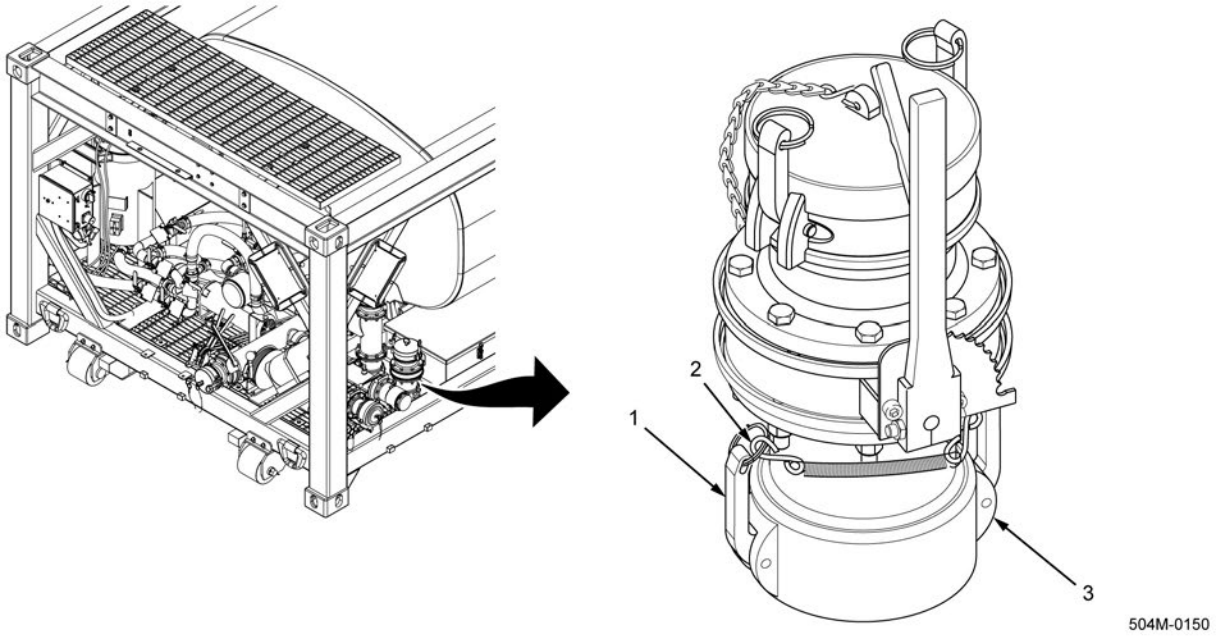


Figure 1. Valve Adapter Assembly Removal.

END OF TASK

DISASSEMBLY

NOTE

Note orientation of hardware and components to aid in installation.

1. Remove valve adapter assembly (Figure 2, Item 1) from mount boss (Figure 2, Item 2) on MFS TRM.
2. Remove one bolt (Figure 2, Item 6), two flat washers (Figure 2, Item 5), one grating clasp (Figure 2, Item 3), one locknut (Figure 2, Item 4), and mount boss (Figure 2, Item 2) from MFS TRM. Discard locknut.

DISASSEMBLY - Continued

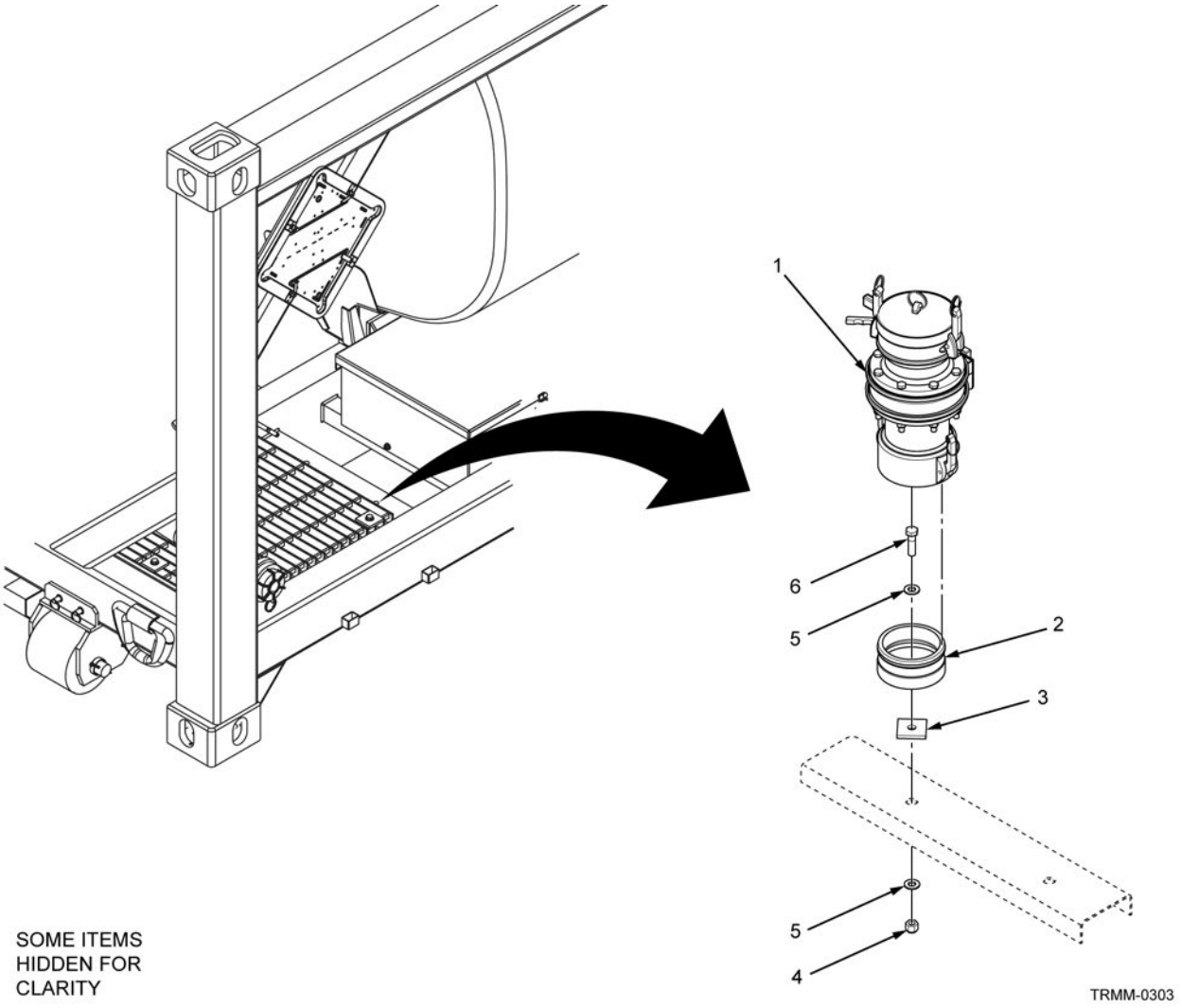


Figure 2. Disassembling Valve Adapter Assembly Mount Boss.

3. Remove dust cap (Figure 3, Item 5) and inspect gasket (Figure 3, Item 6). Inspect gasket (Figure 3, Item 6) on mount boss (Figure 3, Item 1) side. Discard gaskets if damaged.

CAUTION

Close butterfly valve. Damage to equipment could occur if butterfly valve is left open.

4. Place valve adapter in vise.
5. Remove eight bolts (Figure 3, Item 3) and eight locknuts (Figure 3, Item 2) and separate flanged couplings (Figure 3, Items 8 and 12), two spacers (Figure 3, Item 10) and four gaskets (Figure 3, Item 9) from metered butterfly valve (Figure 3, Item 11). Discard locknuts and gaskets.
6. Remove two s-hooks (Figure 3, Item 4) and chain (Figure 3, Item 7) from dust cap (Figure 3, Item 5) and flanged coupling (Figure 3, Item 8).

DISASSEMBLY - Continued

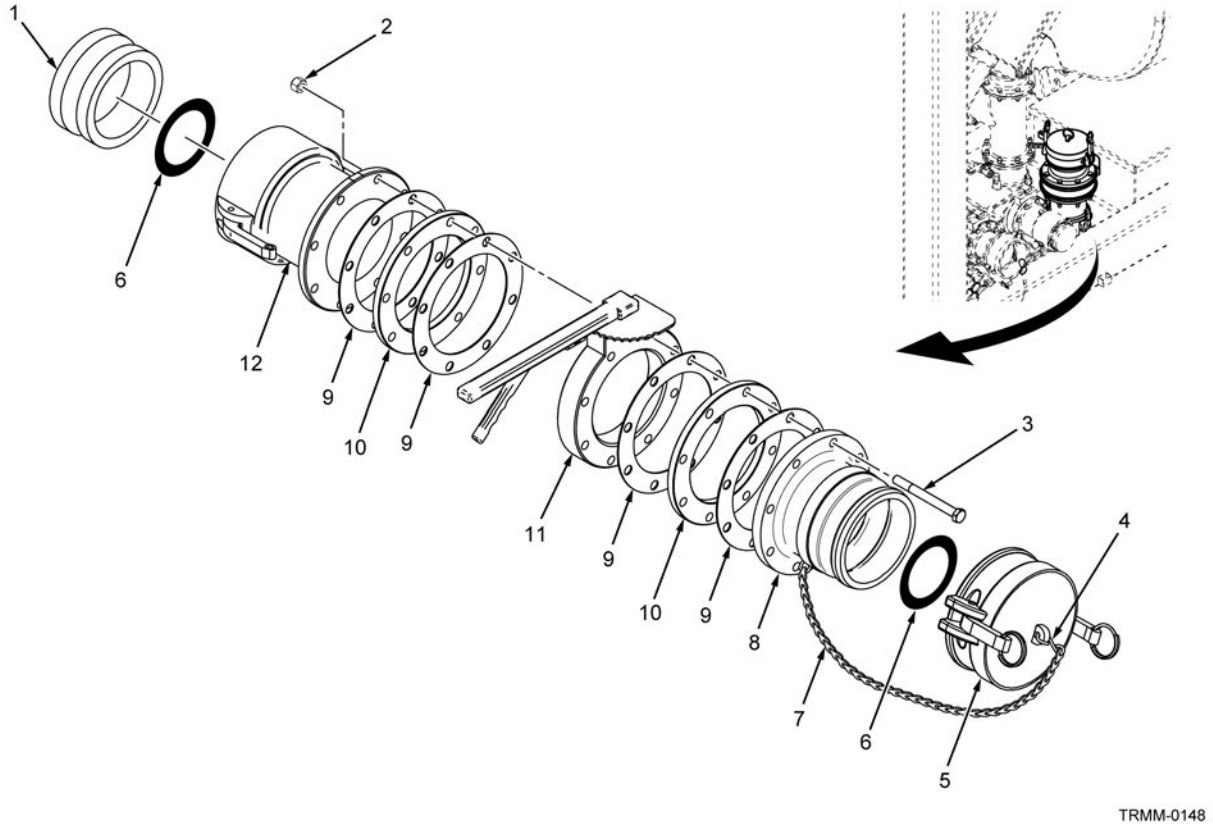


Figure 3. Disassembling Valve Adapter Assembly.

END OF TASK

CLEANING

WARNING

Solvent cleaning compound MIL-PRF-680 Type III is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Keep away from open flames and other sources of ignition. Failure to comply may cause injury to personnel.

1. Remove any residual gasket material from mating surfaces.
2. Remove all buildup of dirt, oil, and debris from all mating surfaces and clamping areas.
3. Clean all metal parts with a cleaning cloth and solvent cleaning compound.

CLEANING - Continued

4. Allow parts to dry thoroughly.

END OF TASK

ASSEMBLY

WARNING

Goggles and gloves must be worn when working around fuel. Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.

1. Install s-hook (Figure 3, Item 4) and chain (Figure 3, Item 7) on dust cap (Figure 3, Item 5) and flanged coupling (Figure 3, Item 8).
2. Assemble four new cork gaskets (Figure 3, Item 9), two spacers (Figure 3, Item 10), flanged couplings (Figure 3, Items 8 and 12), and metered butterfly valve (Figure 3, Item 11).
3. Secure assembly with eight bolts (Figure 3, Item 3) and eight new locknuts (Figure 3, Item 2). Torque nuts to 35 ft-lbs in sequence shown in Figure 4.
4. Install dust cap (Figure 3, Item 5) on flanged coupling (Figure 3, Item 8).

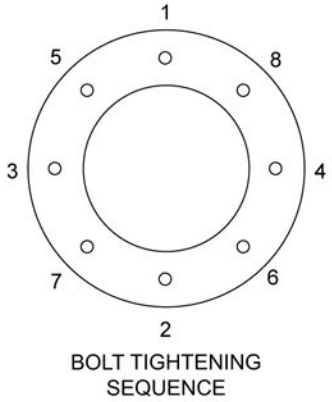


Figure 4. Bolt Tightening Sequence.

END OF TASK

INSTALLATION

1. Install mount boss (Figure 5, Item 2) on MFS TRM using one bolt (Figure 5, Item 6), two flat washers (Figure 5, Item 5), one grating clasp (Figure 5, Item 3), and one new locknut (Figure 5, Item 4).
2. Ensure levers (Figure 1, Item 1) are open and install valve adapter (Figure 1, Item 3) on MFS TRM. Close levers (Figure 1, Item 1).
3. Attach s-hook (Figure 1, Item 2) to split ring on lever (Figure 1, Item 1).

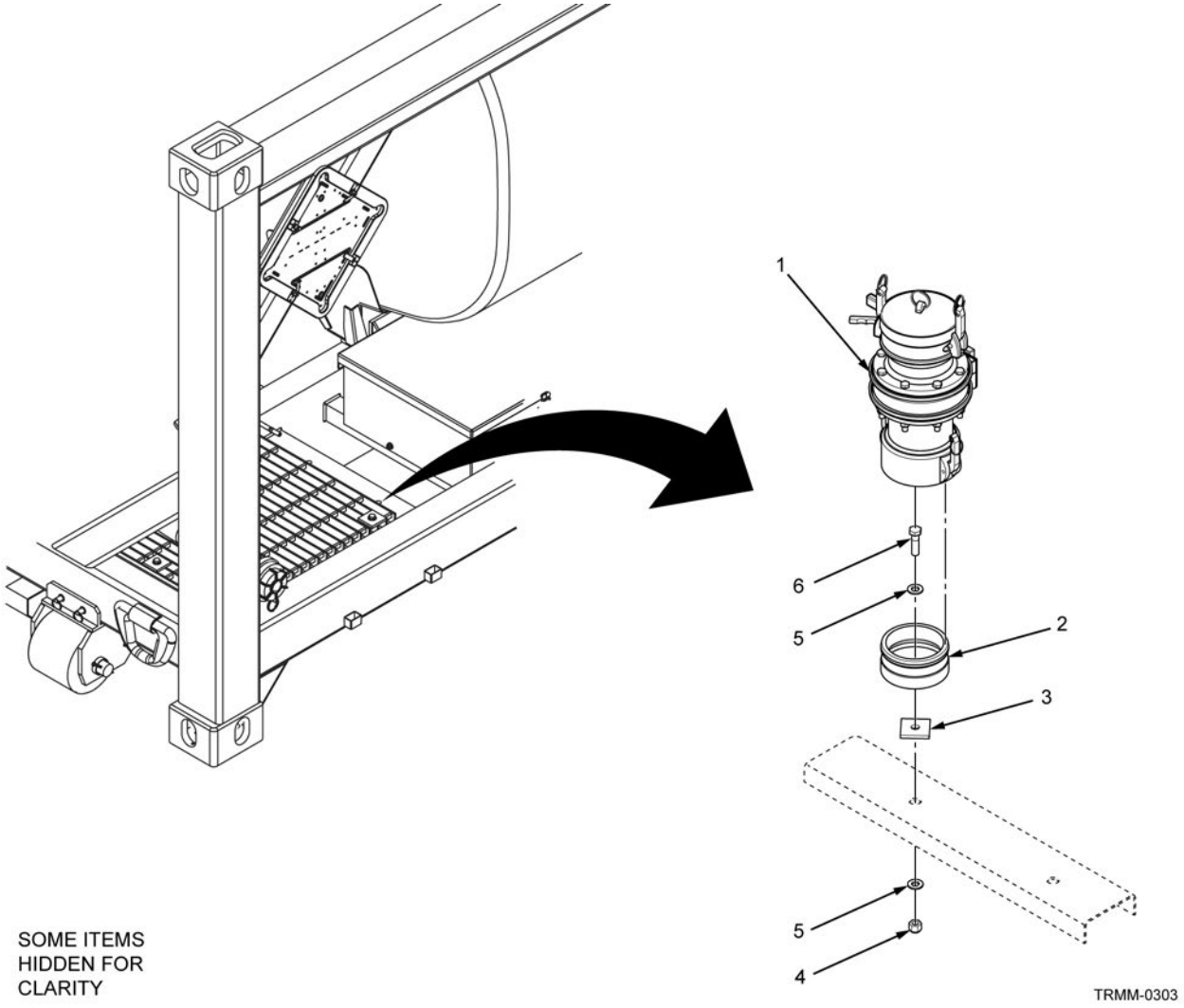


Figure 5. Assembling Valve Adapter Assembly Mount Boss.

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
TEE ASSEMBLY REPAIR

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposable nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)
- Pan, drip (WP 0217, Table 1, Item 8)
- Vise, machinist's (WP 0217, Table 1, Item 14)
- Wrench, torque, click, ratcheting, 3/8 inch drive, 20 to 100 lb-ft. (WP 0217, Table 1, Item 23)

Materials/Parts
- Absorbent material (WP 0216, Table 1, Item 1)
- Cloth, cleaning (WP 0216, Table 1, Item 4)
- Cleaning compound, solvent (WP 0216, Table 1, Item 3)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer

References

Equipment Condition
- MFS TRM grounded (TM 10-4930-371-10)
- MFS TRM shut down (TM 10-4930-371-10)

Time to Complete
- 2 Hour(s)

DISASSEMBLY

NOTE

Note orientation of hardware and components to aid in installation.

1. Remove s-hook (Figure 1, Item 1) from split ring on lever (Figure 1, Item 2).

DISASSEMBLY - Continued

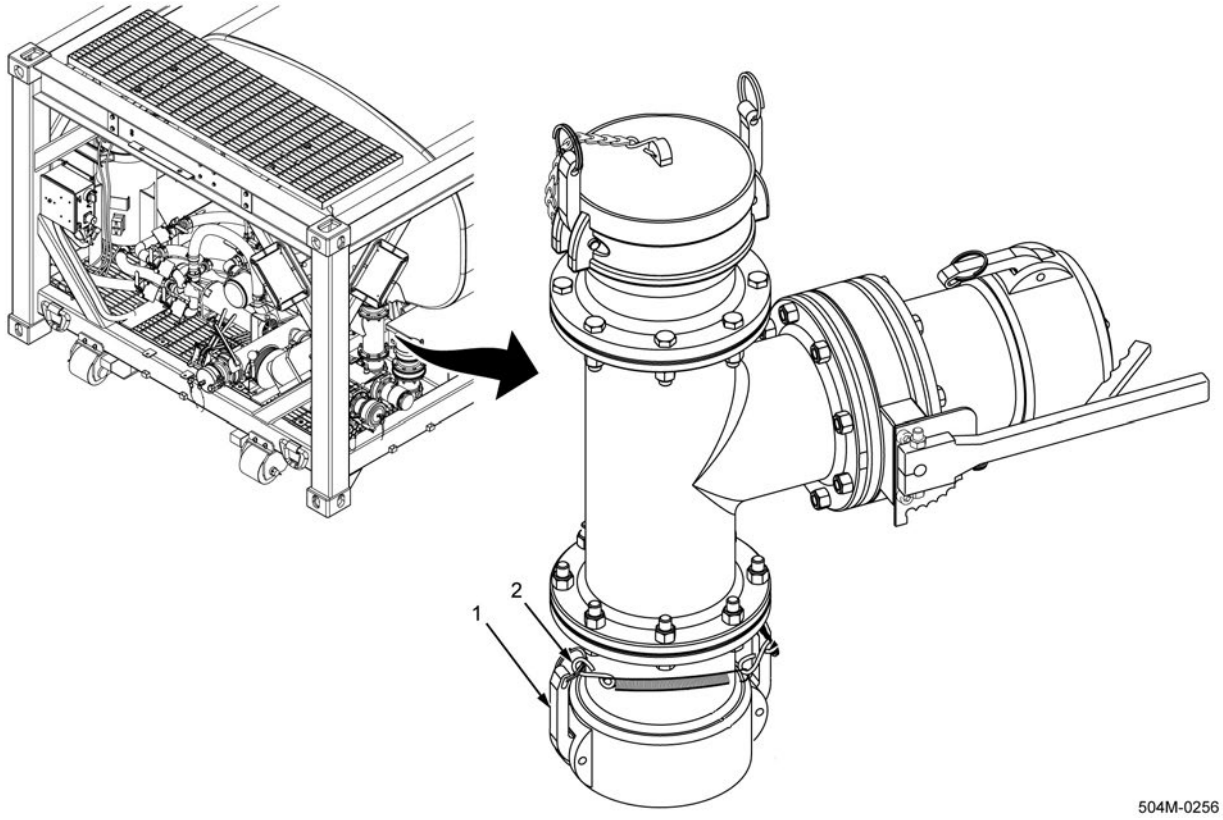


Figure 1. Removing Spring From Tee Assembly.

2. Remove tee assembly (Figure 2, Item 1) from mount boss (Figure 2, Item 2).
3. Remove one bolt (Figure 2, Item 6), two flat washers (Figure 2, Item 5), and one locknut (Figure 2, Item 4) from mount boss (Figure 2, Item 2). Discard locknut.
4. Remove mount boss (Figure 2, Item 2) from MFS TRM.

DISASSEMBLY - Continued

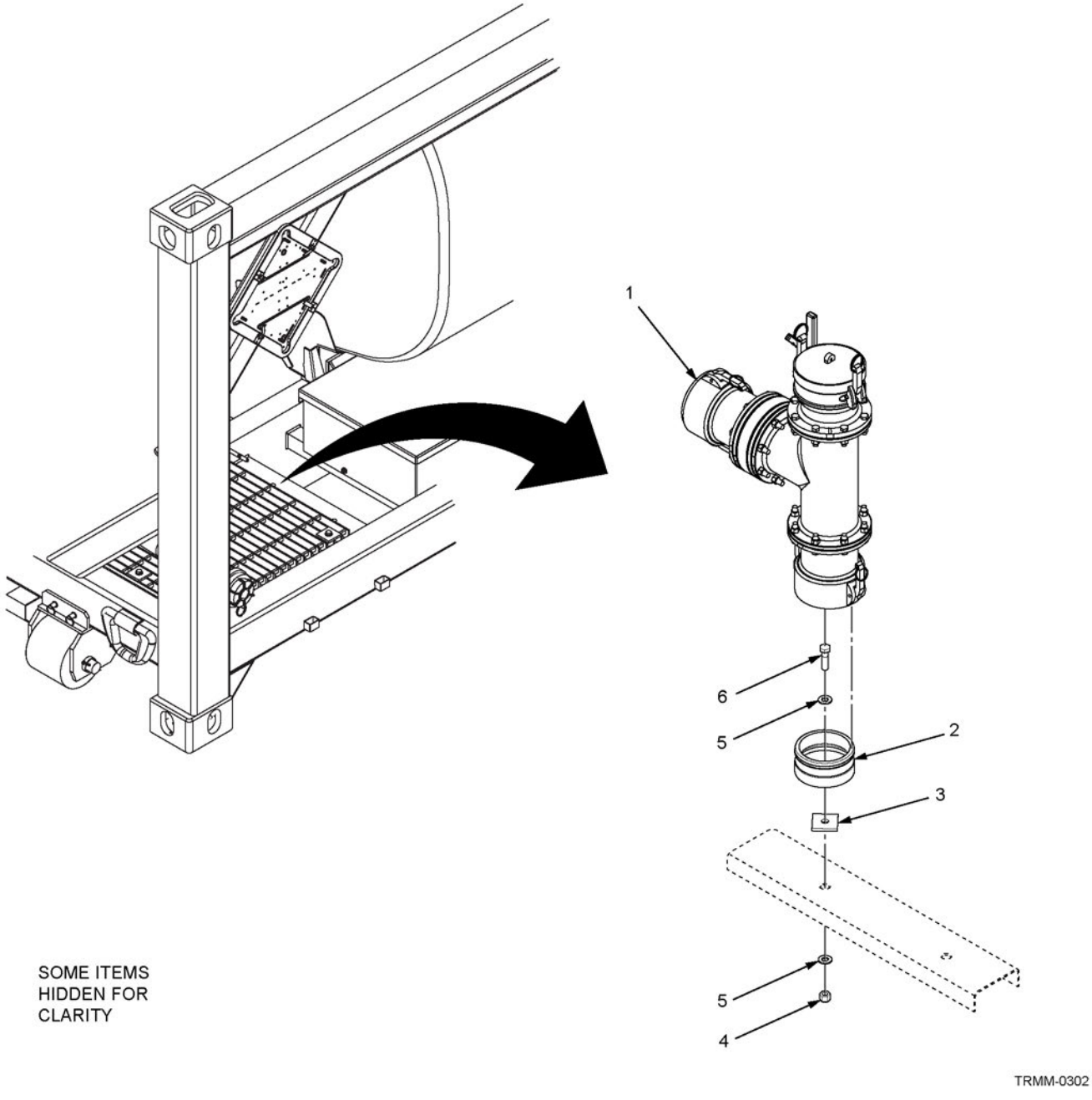


Figure 2. Removing Tee Assembly Mount Boss.

DISASSEMBLY - Continued

5. Ensure metered butterfly valve (Figure 3, Item 13) is closed.
6. Remove dust cap (Figure 3, Item 1) and dust plug (Figure 3, Item 9).
7. Remove two s-hooks and chain (Figure 3, Item 10) from dust cap (Figure 3, Item 1) and tee assembly.
8. Remove two s-hooks and chain (Figure 3, Item 10) from dust plug (Figure 3, Item 9) and tee assembly.
9. Inspect three rubber gaskets (Figure 3, Item 2) and discard if damaged.
10. Remove eight bolts (Figure 3, Item 3), locknuts (Figure 3, Item 6), and separate male flanged coupling (Figure 3, Item 4) from tee (Figure 3, Item 7). Remove cork gasket (Figure 3, Item 5). Discard locknuts (Figure 3, Item 6) and discard gasket.
11. On opposite side of male flange, remove eight bolts (Figure 3, Item 3), locknuts (Figure 3, Item 6), and separate female flanged coupling (Figure 3, Item 8) from tee (Figure 3, Item 7). Remove cork gasket (Figure 3, Item 5) and . Discard locknuts (Figure 3, Item 6) and discard gasket.
12. Remove eight bolts (Figure 3, Item 11) and locknuts (Figure 3, Item 6) and separate female flanged coupling (Figure 3, Item 8), two spacers (Figure 3, Item 12), four cork gaskets (Figure 3, Item 5) and metered butterfly valve (Figure 3, Item 13) from tee (Figure 3, Item 7). Discard gaskets (Figure 3, Item 5) and locknuts (Figure 3, Item 6).

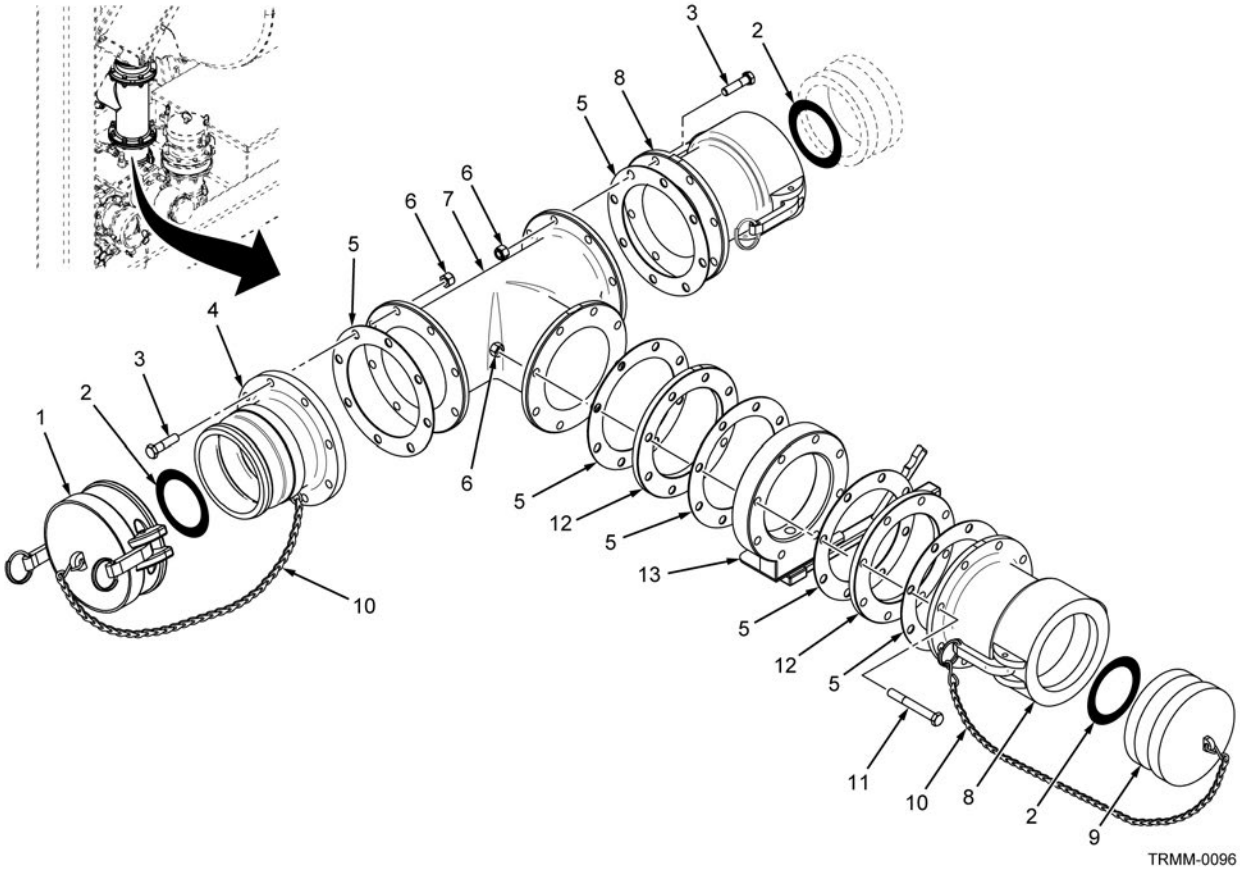


Figure 3. Disassembling Butterfly Valve, Gaskets, and Flanged Couplings.

END OF TASK

CLEANING

WARNING

Solvent cleaning compound MIL-PRF-680 Type III is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Keep away from open flames and other sources of ignition. Failure to comply may cause injury to personnel.

1. Remove any residual gasket material from mating surfaces.
2. Remove all buildup of dirt, oil, and debris from all mating surfaces and clamping areas.
3. Clean all metal parts with a cleaning cloth and solvent cleaning compound.
4. Allow parts to dry thoroughly.

END OF TASK

ASSEMBLY

WARNING

Goggles and gloves must be worn when working around fuel. Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.

1. Assemble male flanged coupling (Figure 3, Item 4) and new cork gasket (Figure 3, Item 5) on tee (Figure 3, Item 7) and secure with eight bolts (Figure 3, Item 3) and new locknuts (Figure 3, Item 6). Tighten locknuts to 35 ft-lbs in standard sequence as shown in Figure 4.
2. Assemble female flanged coupling (Figure 3, Item 8) and new cork gasket (Figure 3, Item 5) on tee (Figure 3, Item 7) and secure with eight bolts (Figure 3, Item 3) and new locknuts (Figure 3, Item 6). Tighten locknuts to 35 ft-lbs in standard sequence as shown in Figure 4.
3. Insert tee assembly in vise.
4. Assemble female flanged coupling (Figure 3, Item 8), two spacers (Figure 3, item 12), four new cork gaskets (Figure 3, item 5), and metered butterfly valve (Figure 3, Item 13) to tee (Figure 3, Item 7) with eight bolts (Figure 3, Item 11) and new locknuts (Figure 3, Item 6). Tighten locknuts to 35 ft-lbs in standard sequence as shown in Figure 4.
5. Install three new rubber gaskets if damaged (Figure 3, Item 2).
6. Install two s-hooks and chain (Figure 3, Item 10) on dust plug (Figure 3, Item 9) and tee assembly.
7. Install dust plug (Figure 3, Item 9).
8. Install two s-hooks and chain (Figure 3, Item 10) on dust cap (Figure 3, Item 1) and tee assembly.
9. Install dust cap (Figure 3, Item 1).

ASSEMBLY - Continued

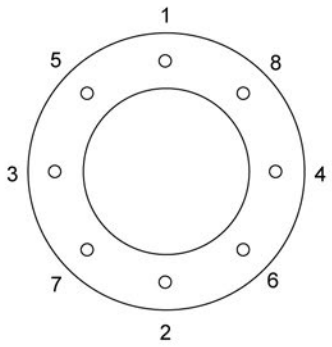


Figure 4. Bolt Tightening Sequence.

10. Install mount boss (Figure 5, Item 2) and secure with one bolt (Figure 5, Item 6), two flat washers (Figure 5, Item 5), and one locknut (Figure 5, Item 4).

ASSEMBLY - Continued

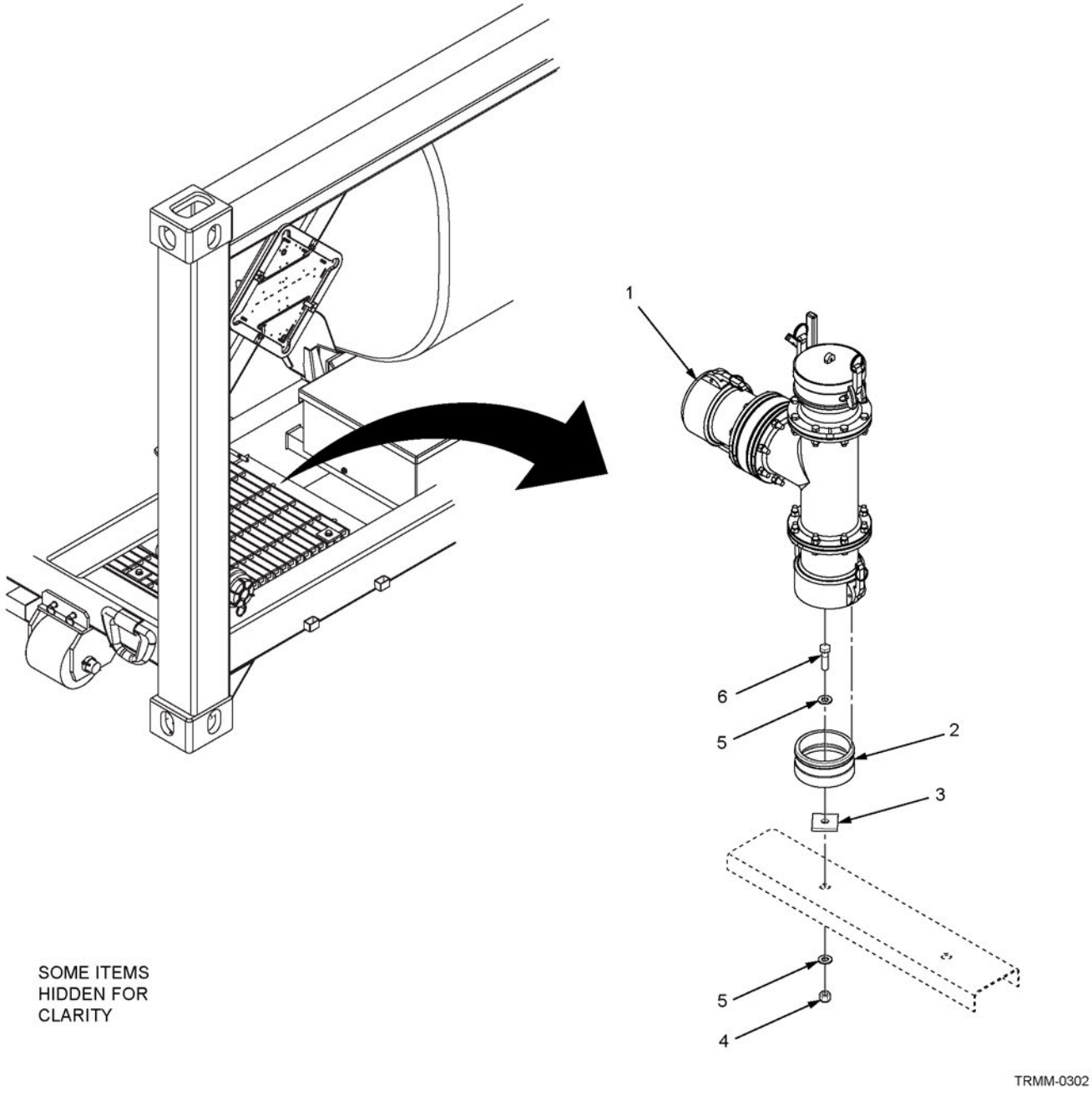


Figure 5. Installing Tee Assembly Mount Boss.

ASSEMBLY - Continued

11. Install s-hook (Figure 6, Item 1) on split ring on lever (Figure 6, Item 2).

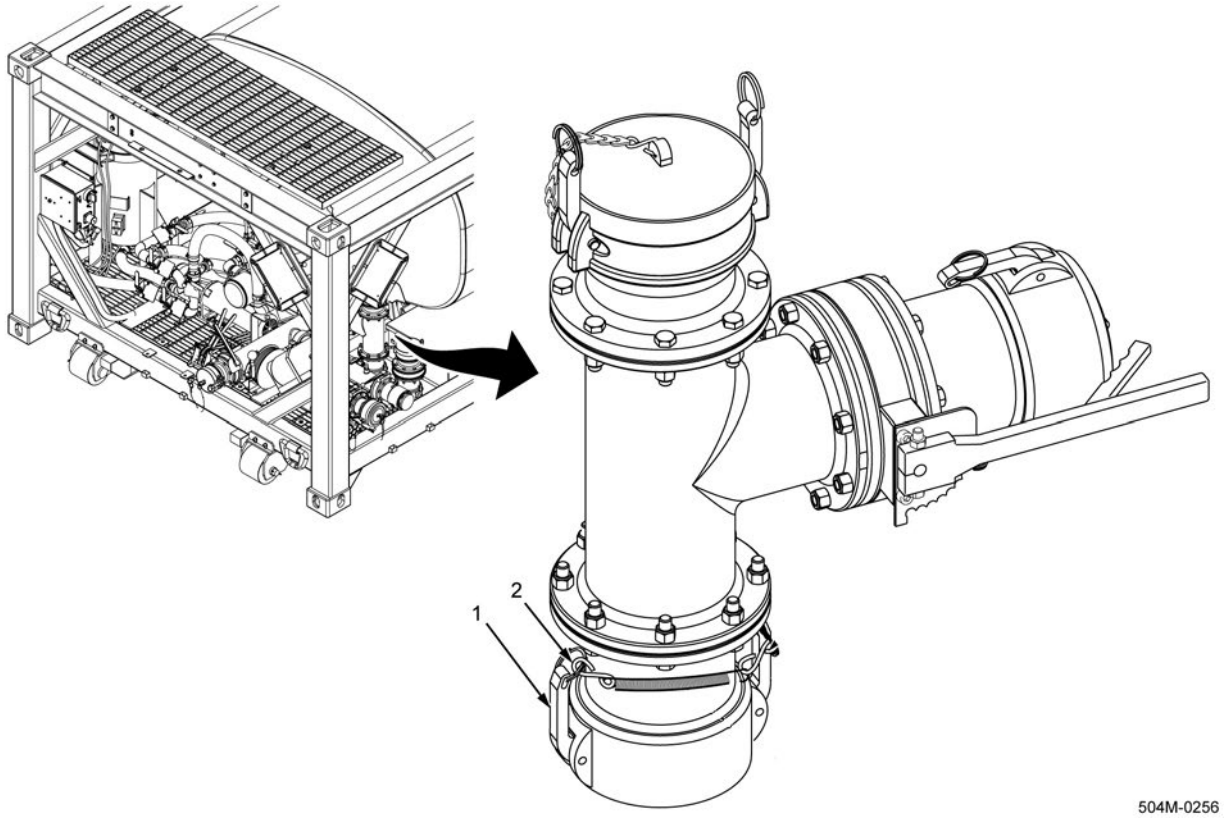


Figure 6. Installing Spring OnTee Assembly.

12. Install tee assembly (Figure 5, Item 1) on MFS TRM.

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
FLEXIBLE HOSES REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposable nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)
- Pan, drip (WP 0217, Table 1, Item 8)
- Pliers, multiple position (WP 0217, Table 1, Item 9)

Materials/Parts
- Absorbent material (WP 0216, Table 1, Item 1)
- Clamp, Hose Qty: 20 (WP 0176, Figure 30, Item 2)
- Nut, Self-locking, Hexagon (LOCKNUTS) Qty: 3 (WP 0176, Figure 30, Item 16)
- Flexible Hose, 17" (WP 0176, Figure 30, Item 4)
- Flexible Hose, 20" (WP 0176, Figure 30, Item 11)
- Flexible Hose, 24" (WP 0176, Figure 30, Item 8)
- Flexible Hose, 29" (WP 0176, Figure 30, Item 5)
- Flexible Hose, 29" (WP 0176, Figure 30, Item 7)
- Flexible Hose, 32" (WP 0176, Figure 30, Item 6)
- Flexible Hose, 42" (WP 0176, Figure 30, Item 3)
- Flexible Hose, 44" (WP 0176, Figure 30, Item 10)
- Flexible Hose, 56" (WP 0176, Figure 30, Item 9)

Materials/Parts (cont.)
- Flexible Hose, 72" (WP 0176, Figure 30, Item 12)
- ADR Flexible Hose, 30" (WP 0176, Figure 30, Item 18)
- ADR Flexible Hose, 62" (WP 0176, Figure 30, Item 19)
- ADR Flexible Hose, 22" (WP 0176, Figure 30, Item 17)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer

References
- ATP 4-43
- TM 10-4930-371-10

Equipment Condition
- MFS TRM grounded (TM 10-4930-371-10)
- MFS TRM piping manifold evacuated (TM 10-4930-371-10)

Time to Complete
- 1 Hour(s)

REMOVAL

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Failure to comply could result in injury or death to personnel.

NOTE

Flexible hoses (Figure 1, Items 1, 7, and 12) are shorter on TRM with ADR systems.

1. Place drip pan under MFS TRM to catch residual fuel.
2. Locate hose to be replaced (Figure 1, Items 1 through 10).

NOTE

If necessary, loosen bracket hardware to remove hose.

3. Loosen two nuts (Figure 2, Item 4) on hose clamps (Figure 2, Item 2) securing flexible hose (Figure 2, Item 3) to hose barb (Figure 2, Item 1).
4. Remove two hose clamps (Figure 2, Item 2) from flexible hose (Figure 2, Item 3) and retain for use with new flexible hose.
5. Pull flexible hose (Figure 2, Item 3) free from hose barbs (Figure 2, Item 1).
6. Remove drip pan and dispose of any fuel IAW unit SOP.

REMOVAL - Continued

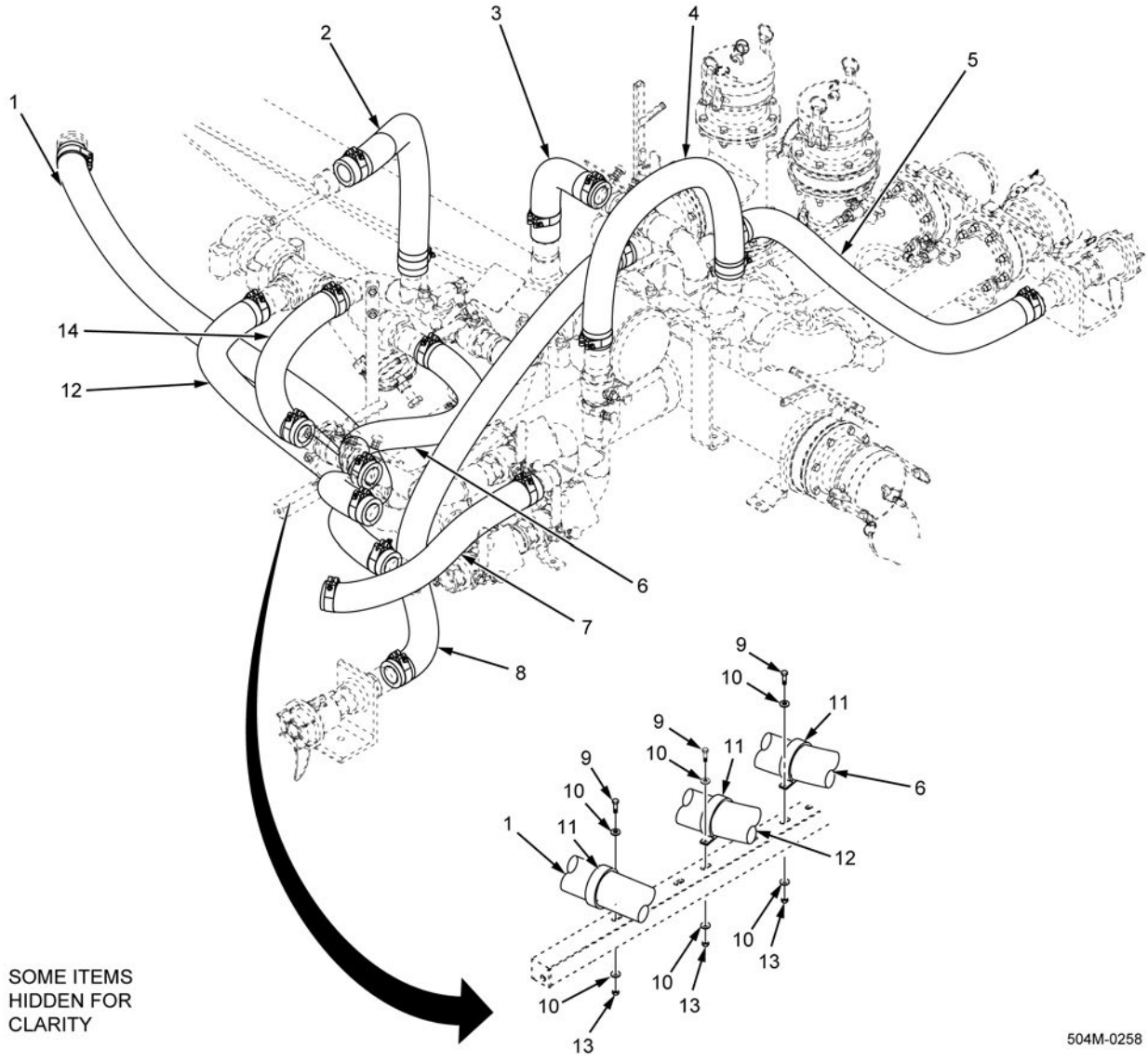


Figure 1. Flexible Hose Locations.

NOTE

TRM with ADR has two hoses, cushion clamps, and associated hardware.

7. If removing hoses (Figure 1, Items 1, 6, or 12), remove cushion clamp (Figure 1, Item 11), one bolt (Figure 1, Item 9), two flat washers (Figure 1, Item 10), and one locknut (Figure 1, Item 13). Discard locknut.

END OF TASK

INSTALLATION

1. Install new flexible hose (Figure 2, Item 3) onto hose barbs (Figure 2, Item 1).
2. Install two hose clamps (Figure 2, Item 2) into place and secure.

INSTALLATION - Continued

3. If installing hoses (Figure 1, Items 1, 6, or 12), install cushion clamp (Figure 1, Item 11), with one bolt (Figure 1, Item 9), two flat washers (Figure 1, Item 10), and one new locknut (Figure 1, Item 13).

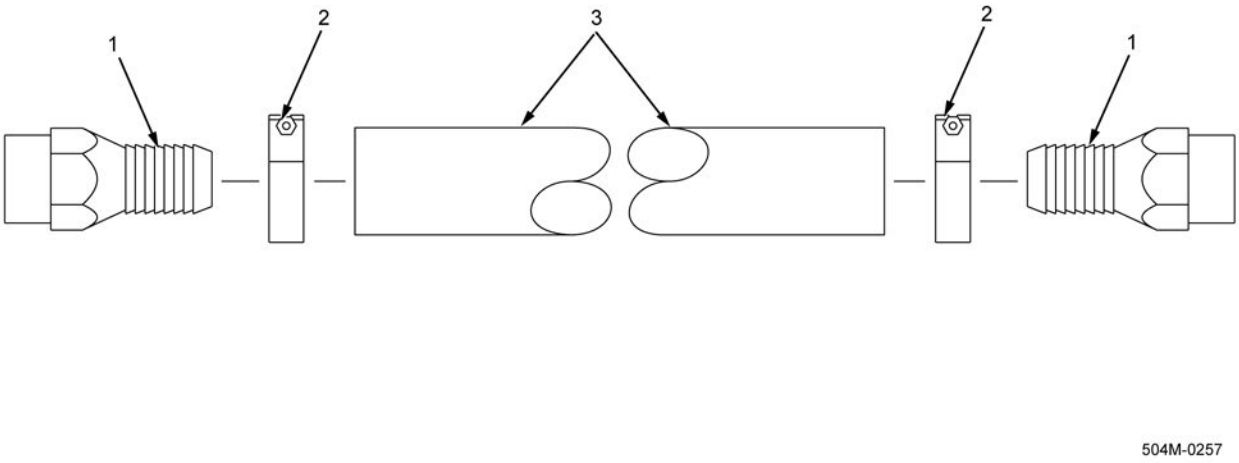


Figure 2. Replacing Flexible Hose.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Set up MFS TRM (TM 10-4930-371-10).
2. Check MFS TRM for leaks by recirculating fuel (TM 10-4930-371-10).

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
LEFT SIDE PIPING ASSEMBLY REPAIR

INITIAL SETUP:

Tools and Special Tools
Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
Fire extinguisher (TM 10-4930-371-10)
Gloves, disposable nitrile (WP 0216, Table 1, Item 5)
Goggles, industrial (WP 0216, Table 1, Item 6)
Pan, drip (WP 0217, Table 1, Item 8)

Materials/Parts
Absorbent material (WP 0216, Table 1, Item 1)

Personnel Required
91J Quartermaster and Chemical Equipment Repairer (2)

References
ATP 4-43

References (cont.)
TM 10-4930-371-10
WP 0089

Equipment Condition
MFS TRM grounded (TM 10-4930-371-10)
Piping manifold evacuated (TM 10-4930-371-10)
Ball valve placards removed (WP 0089)

Time to Complete
2 Hour(s)

REMOVAL

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Failure to comply could result in injury or death to personnel.

REMOVAL - Continued

NOTE

- Due to the characteristics of brass and aluminum threaded piping connections and the force required to assemble and disassemble threaded connections, it is preferred to remove complete piping assemblies intact and secure them to a rigid work platform before attempting to assemble or disassemble the individual fittings.
- Note orientation of hardware and components to aid in installation.

1. Place drip pan under MFS TRM positioned to catch residual fuel.
2. Remove hose clamp (Figure 1, Item 2) and remove hose (Figure 1, Item 1).

NOTE

It may be necessary to loosen U-bolt and hardware.

3. Remove hose clamp (Figure 1, Item 2) and remove hose (Figure 1, Item 3).
4. Remove hose clamp (Figure 1, Item 2) and remove hose (Figure 1, Item 4).
5. Remove hose clamp (Figure 1, Item 2) and remove hose (Figure 1, Item 5).
6. Remove hose clamp (Figure 1, Item 2) and remove hose (Figure 1, Item 6).

REMOVAL - Continued

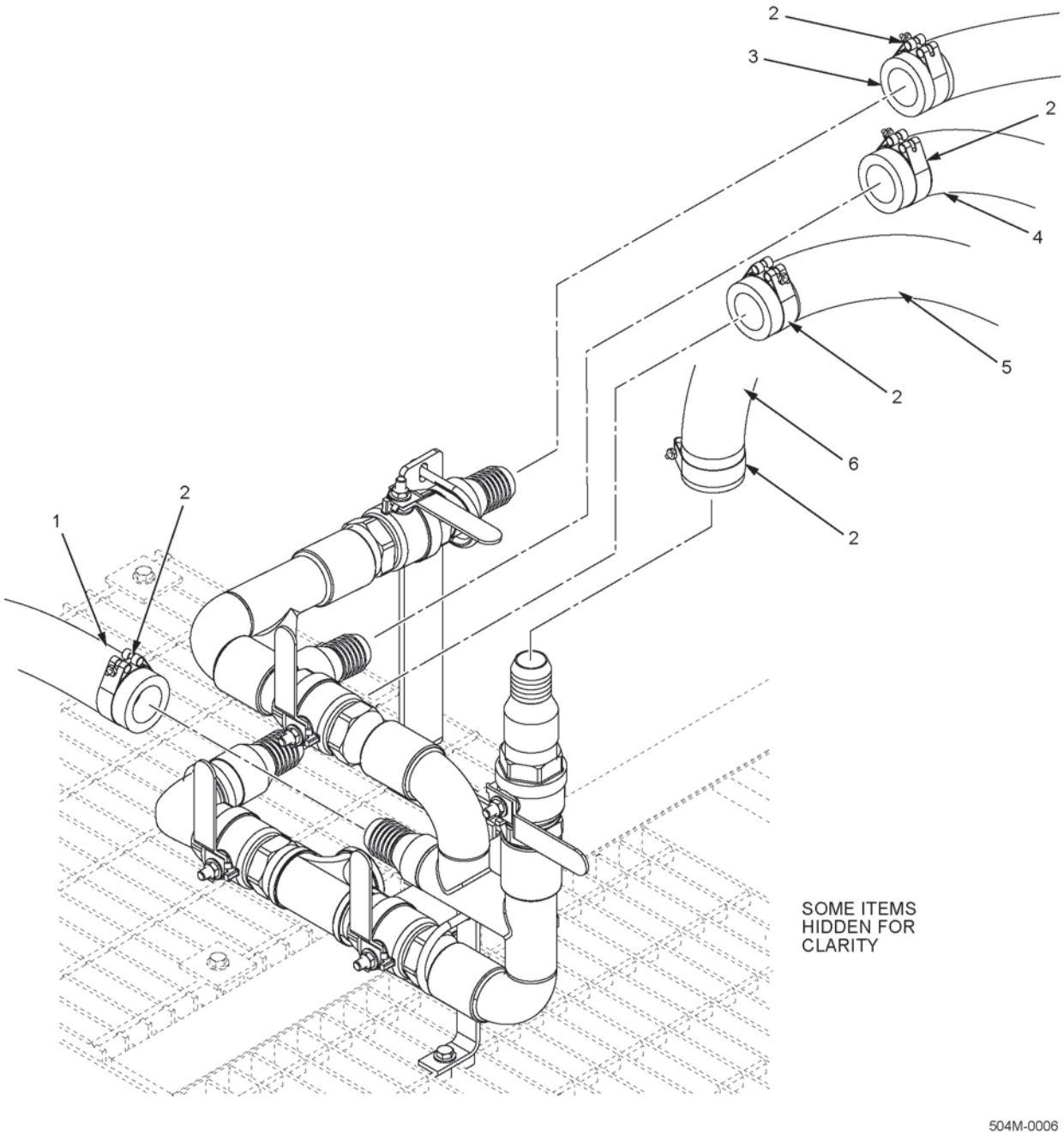


Figure 1. Disconnecting Left Side Piping Assembly.

7. Remove two coupling nuts (Figure 2, Item 1) and two bolts (Figure 2, Item 5).
8. Remove couplings halves (Figure 2, Item 2).
9. Slide coupling gasket (Figure 2, Item 4) onto pump nipple (Figure 2, Item 3).

REMOVAL - Continued

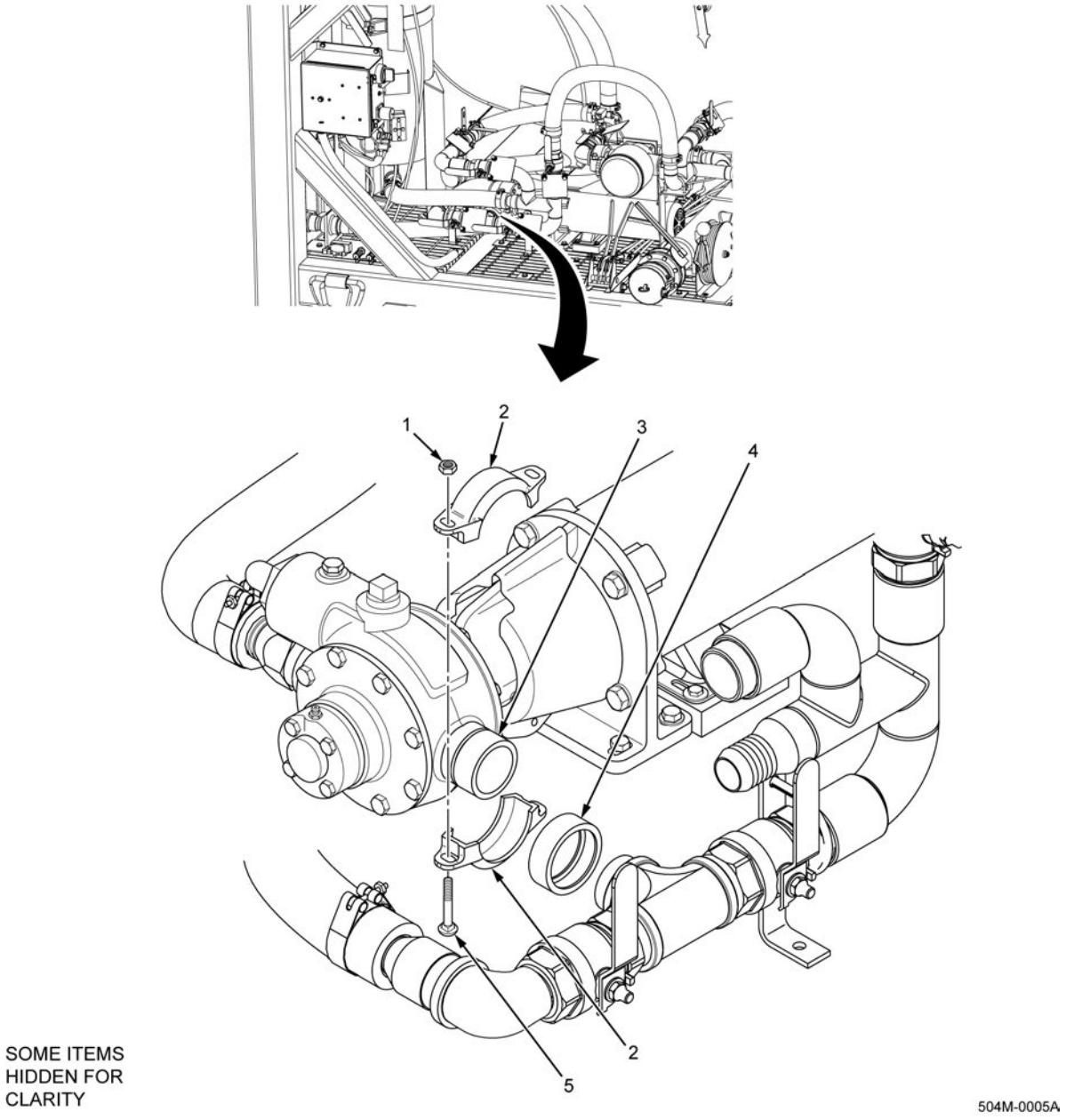


Figure 2. Disconnecting Left Side Piping Assembly from Pump Assembly.

10. Remove four locknuts (Figure 3, Item 1) and four flat washers (Figure 3, Item 2), and remove two U-bolts (Figure 3, Item 4) from bracket (Figure 3, Item 3). Discard locknuts.

REMOVAL - Continued

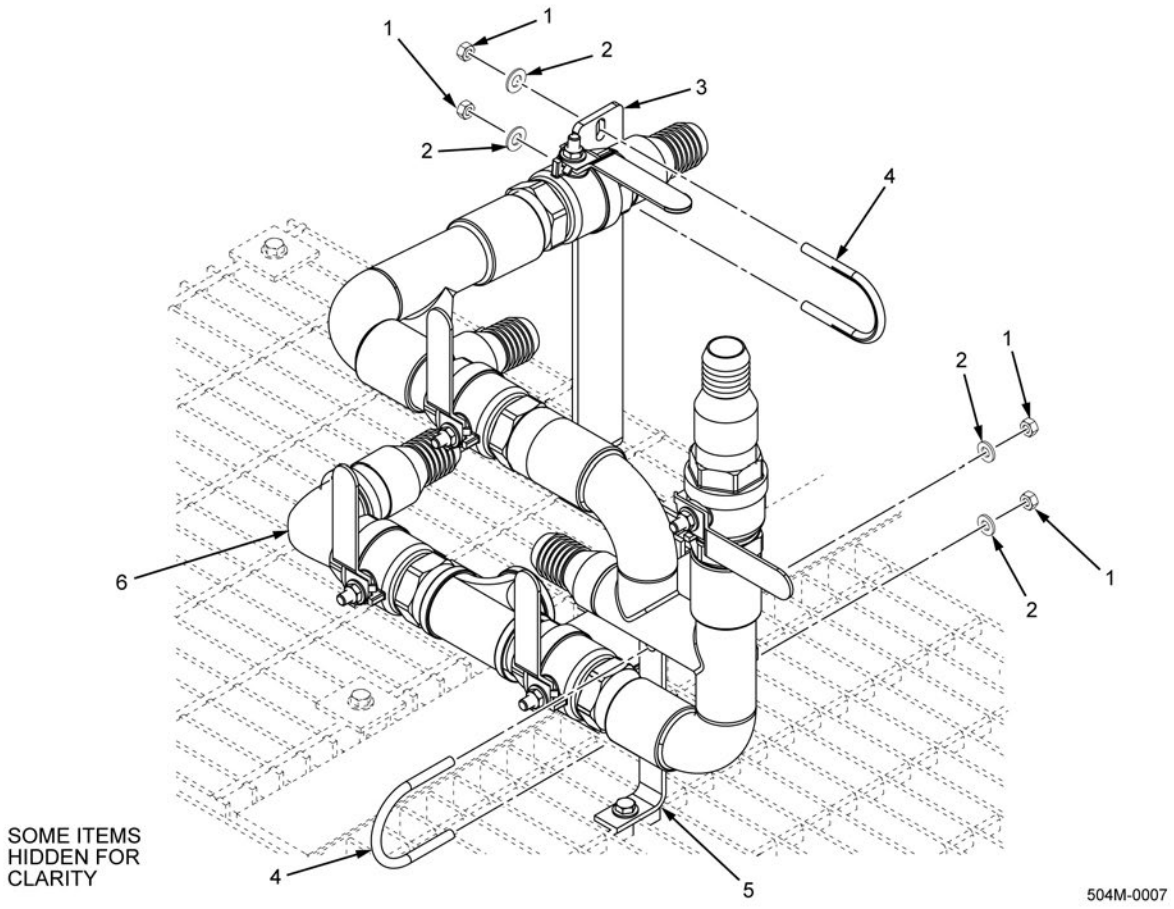


Figure 3. Removing Left Side Piping Assembly.

11. Remove left side piping assembly (Figure 3, Item 6). Discard coupling gasket.
12. Tilt piping assembly and drain excess fuel.
13. Remove drip pan and dispose of fuel IAW unit SOP.

END OF TASK

CLEANING

WARNING

Solvent cleaning compound MIL-PRF-680 Type III is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Keep away from open flames and other sources of ignition. Failure to comply may cause injury to personnel.

CLEANING - Continued

1. Clean threads of all disassembled components. Remove all buildup of dirt, oil, and debris from threads.
2. Clean all metal parts with a cleaning cloth and solvent cleaning compound.
3. Allow parts to dry thoroughly.

END OF TASK

INSTALLATION

1. Lubricate and install new coupling gasket (Figure 4, Item 4) onto pump nipple (Figure 4, Item 3).
2. Align left side piping assembly (Figure 3, Item 6) on MFS TRM.
3. Center new coupling gasket (Figure 4, Item 4) on pump nipple (Figure 4, Item 3) and tee fitting nipple (Figure 4, Item 5).
4. Install coupling halves (Figure 4, Item 2) and secure with two bolts (Figure 4, Item 6) and two nuts (Figure 4, Item 1).

INSTALLATION - Continued

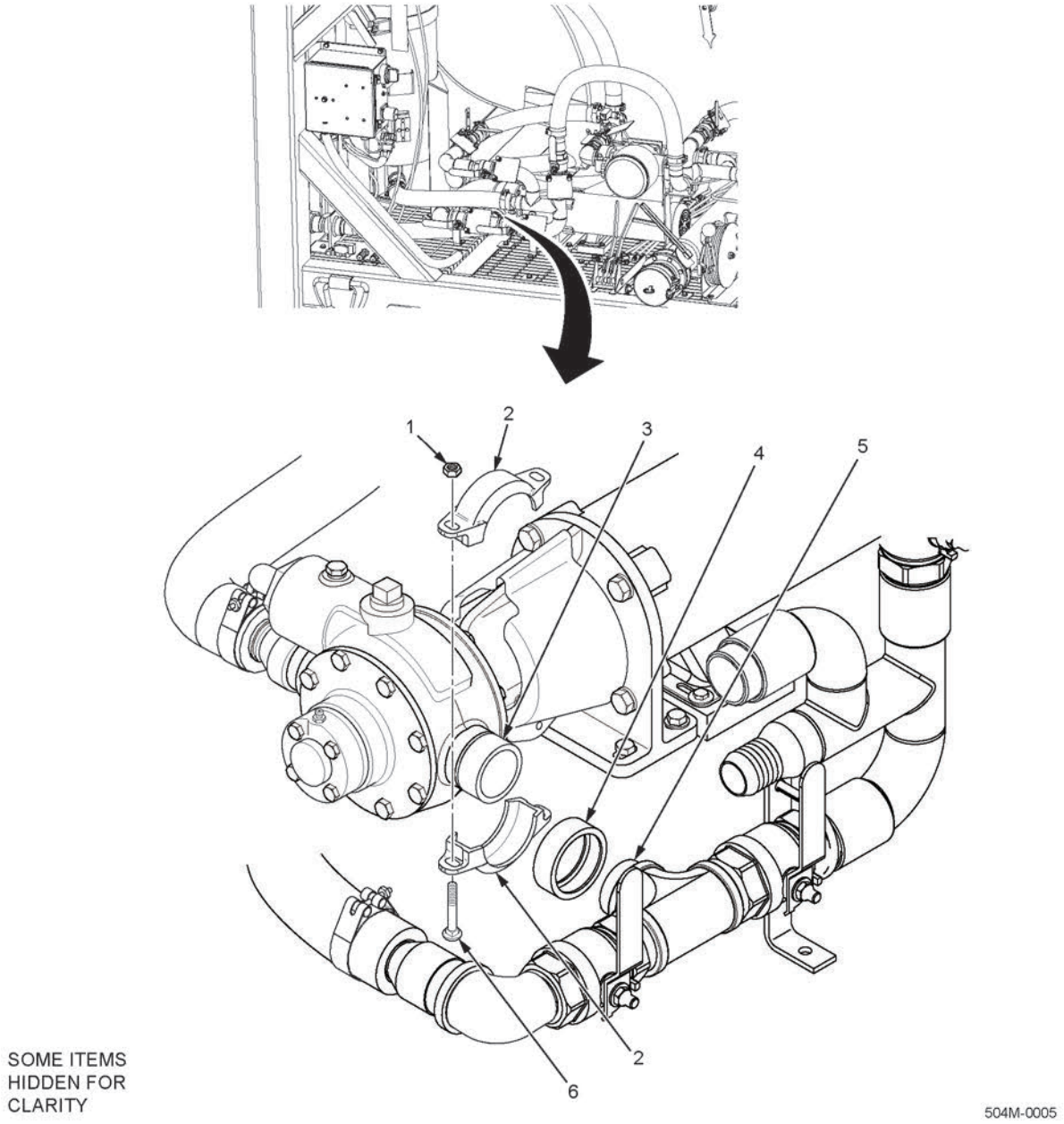


Figure 4. Connecting Left Side Piping Assembly to Pump Assembly.

5. Adjust left side piping assembly into position as noted during removal on MFS TRM and loosely install U-bolts (Figure 5, Item 4), on two support brackets (Figure 5, Items 3 and 5) with four flat washers (Figure 5, Item 2), and four new locknuts (Figure 5, Item 1).

INSTALLATION - Continued

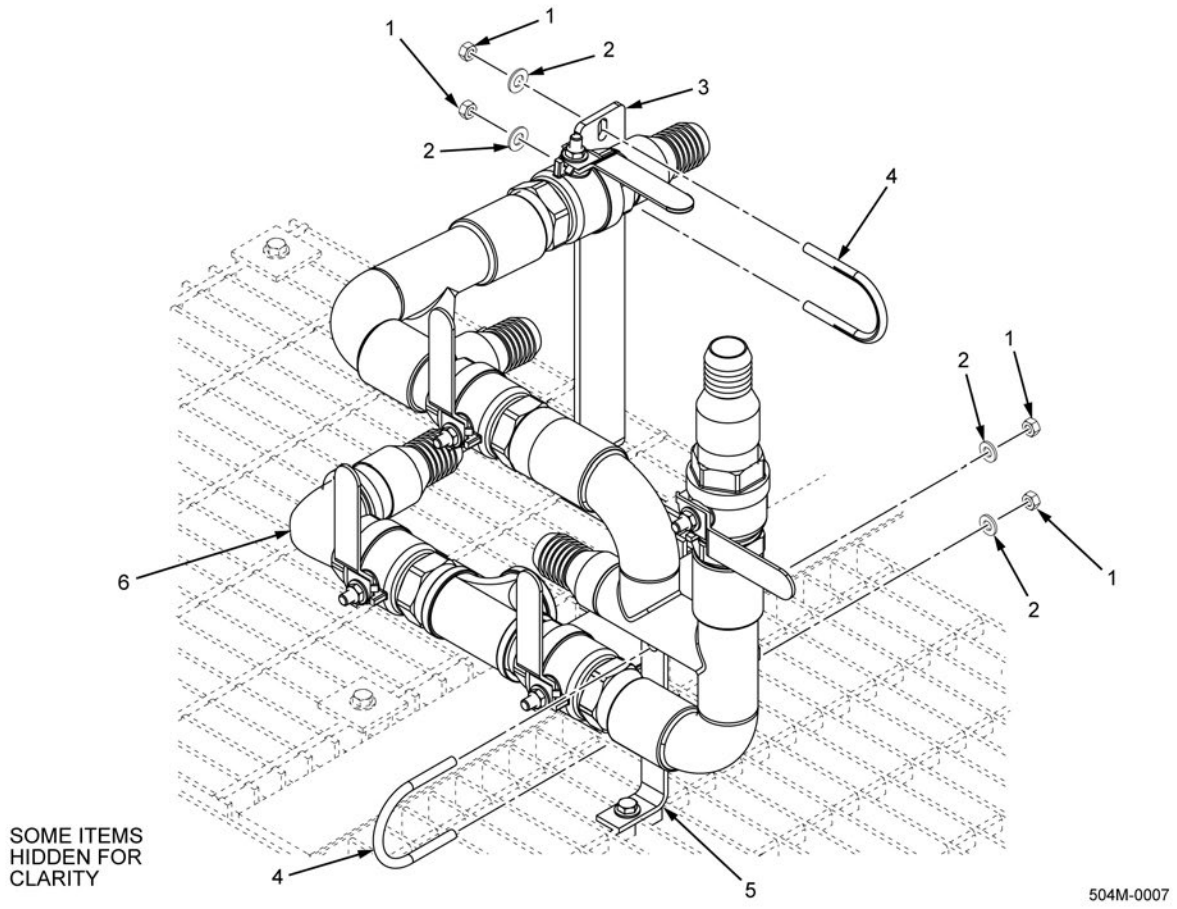


Figure 5. Installing Left Side Piping Assembly.

6. Tighten U-bolt locknuts (Figure 5, Item 1) on support brackets (Figure 5, Items 3 and 5).
7. Install hose (Figure 6, Item 1) and secure with hose clamp (Figure 6, Item 2).

INSTALLATION - Continued

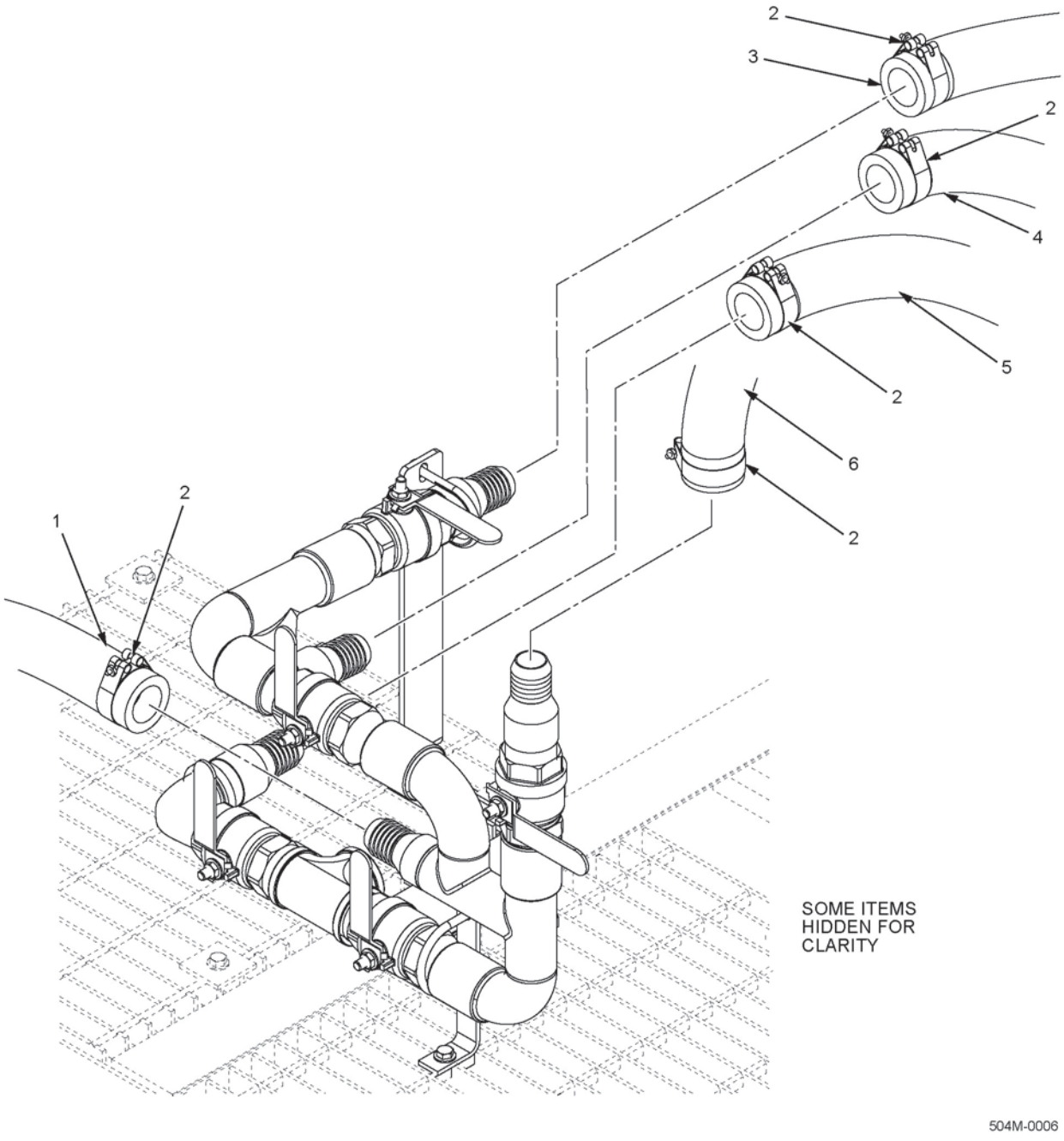


Figure 6. Connecting Left Side Piping Assembly.

8. Install hose (Figure 6, Item 3) and secure with hose clamp (Figure 6, Item 2).
9. Install hose (Figure 6, Item 4) and secure with hose clamp (Figure 6, Item 2).
10. Install hose (Figure 6, Item 5) and secure with hose clamp (Figure 6, Item 2).

INSTALLATION - Continued

11. Install hose (Figure 6, Item 6) and secure with hose clamp (Figure 6, Item 2).

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install ball valve placards (WP 0089).
2. Set up MFS TRM (TM 10-4930-371-10).
3. Check MFS TRM for leaks by recirculating fuel (TM 10-4930-371-10).

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
TANK RETURN BALL VALVE (V9) REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposable nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)
- Pan, drip (WP 0217, Table 1, Item 8)
- Vise, machinist's (WP 0217, Table 1, Item 14)
- Wrench, adjustable, automotive (WP 0217, Table 1, Item 17)
- Wrench, internal pipe (WP 0217, Table 1, Item 18)

Materials/Parts
- Absorbent material (WP 0216, Table 1, Item 1)
- Cloth, cleaning (WP 0216, Table 1, Item 4)
- Cleaning compound, solvent (WP 0216, Table 1, Item 3)
- Thread sealing compound (WP 0216, Table 1, Item 15)
- Ball Valve (WP 0177, Figure 31, Item 4)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer

References
- ATP 4-43
- TM 10-4930-371-10
- WP 0084
- WP 0089

Equipment Condition
- MFS TRM grounded (TM 10-4930-371-10)
- Piping manifold evacuated (TM 10-4930-371-10)
- Left side piping assembly removed (WP 0084)
- (V9) ball valve placard removed (WP 0089)

Time to Complete
- 2 Hour(s)

REMOVAL

WARNING

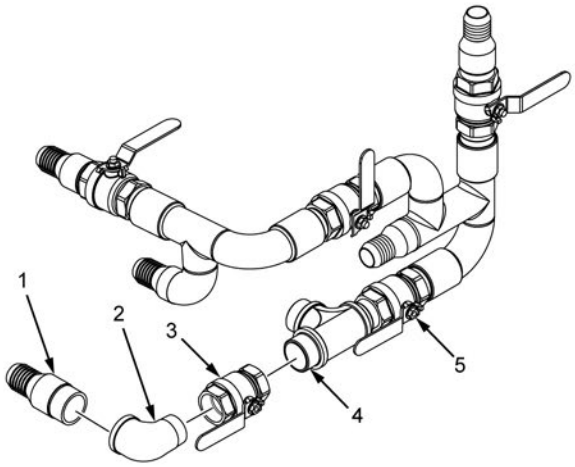
- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Use a drip pan to collect leaking fuel. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.

REMOVAL - Continued

NOTE

Note orientation of hardware and components to aid in installation.

1. Place left side piping in vise.
2. Unscrew hose barb (Figure 1, Item 1) from elbow (Figure 1, Item 2).
3. At the tee side, remove elbow (Figure 1, Item 2), and tank return ball valve (V9) (Figure 1, Item 3) from left side piping assembly.
4. At the hexagon between the elbow (Figure 1, Item 2) and tank return ball valve (V9) (Figure 1, Item 3), remove the ball valve from the elbow.
5. If the nipple (Figure 1, Item 4) comes out with tank return ball valve (V9) (Figure 1, Item 3), remove the nipple from the tank return ball valve (V9) (Figure 1, Item 3) and retain for installation.



TRMM-0040

Figure 1. Replacing Tank Return Ball Valve (V9).

END OF TASK

CLEANING

WARNING

Solvent cleaning compound MIL-PRF-680 Type III is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Keep away from open flames and other sources of ignition. Failure to comply may cause injury to personnel.

1. Clean all threads. Remove all buildup of dirt, oil, and debris from threads.
2. Clean all metal parts with a cleaning cloth and solvent cleaning compound.

CLEANING - Continued

3. Allow all parts to dry thoroughly.

END OF TASK

INSTALLATION

WARNING

Thread sealing compound is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Failure to comply may cause injury to personnel.

1. Apply thread sealing compound to all threads.
2. Install new tank return ball valve (V9) (Figure 1, Item 3) on elbow (Figure 1, Item 2). Tighten using the hexagon between the ball valve and elbow.
3. If nipple (Figure 1, Item 4) was removed, reinstall on left side piping assembly (Figure 1, Item 5).
4. Install new tank return ball valve (V9) (Figure 1, Item 3) onto nipple (Figure 1, Item 4). Tighten using the hexagon between the ball valve and nipple.
5. Install hose barb (Figure 1, Item 1) into elbow (Figure 1, Item 2).

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install left side piping assembly (WP 0084).
2. Install (V9) ball valve placard (WP 0089).
3. Set up MFS TRM (TM 10-4930-371-10).
4. Check MFS TRM for leaks by recirculating fuel (TM 10-4930-371-10).

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
PUMP DISCHARGE BALL VALVE (V10/V11) REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposable nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)
- Pan, drip (WP 0217, Table 1, Item 8)
- Vise, machinist's (WP 0217, Table 1, Item 14)
- Wire brush (WP 0217, Table 1, Item 15)
- Wrench, adjustable, automotive (WP 0217, Table 1, Item 17)
- Wrench, internal pipe (WP 0217, Table 1, Item 18)
- Wrench, pipe, 18 inch (WP 0217, Table 1, Item 19)

Materials/Parts
- Absorbent material (WP 0216, Table 1, Item 1)
- Cleaning compound, solvent (WP 0216, Table 1, Item 3)
- Cloth, cleaning (WP 0216, Table 1, Item 4)
- Thread sealing compound (WP 0216, Table 1, Item 15)
- Ball Valve (WP 0177, Figure 31, Item 4)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer (2)

References
- ATP 4-43
- TM 10-4930-371-10
- WP 0084
- WP 0085

Equipment Condition
- MFS TRM grounded (TM 10-4930-371-10)
- Piping manifold evacuated (TM 10-4930-371-10)
- Left side piping assembly removed (WP 0084)
- Ball valve (V9) removed (WP 0085)

Time to Complete
- 1.5 Hour(s)

REMOVAL

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Failure to comply could result in injury or death to personnel.

NOTE

Note orientation of hardware and components to aid in installation.

1. To remove ball valve (V10) (Figure 1, Item 6), perform the following steps:
   a. Place left side piping in vise.
   b. At the hexagon between the ball valve (V10) (Figure 1, Item 6) and left side piping assembly (Figure 1, Item 4), remove the ball valve (V10) (Figure 1, Item 6) and tee (Figure 1, Item 8) from left side piping assembly (Figure 1, Item 4).
   c. At the hexagon between the ball valve (V10) (Figure 1, Item 6) and tee (Figure 1, Item 8), remove ball valve (V10) (Figure 1, Item 6) from tee (Figure 1, Item 8).
   d. If nipple (Figure 1, Item 7) is removed with ball valve (V10) (Figure 1, Item 6), remove nipple (Figure 1, Item 7) from ball valve (V10) (Figure 1, Item 6) and retain for installation.
   e. If necessary, remove nipple (Figure 1, Item 5).
2. To remove pump discharge ball valve (V11) (Figure 1, Item 2), perform the following steps:
   a. Place left side piping in vise.
   b. At the hexagon between the pump discharge ball valve (V11) (Figure 1, Item 2) and left side piping assembly (Figure 1, Item 4), remove the pump discharge ball valve (V11) (Figure 1, Item 2) and left side piping assembly (Figure 1, Item 9).
   c. At the hexagon between ball valve (V10) (Figure 1, Item 2) and left side piping assembly (Figure 1, Item 9), remove ball valve (V10) (Figure 1, Item 2) from left side piping assembly (Figure 1, Item 9).
   d. If nipple (Figure 1, Item 1) is removed with ball valve (V10) (Figure 1, Item 2), remove nipple (Figure 1, Item 1) from ball valve (V10) (Figure 1, Item 2) and retain for installation.
   e. If necessary, remove nipple (Figure 1, Item 3).

REMOVAL - Continued

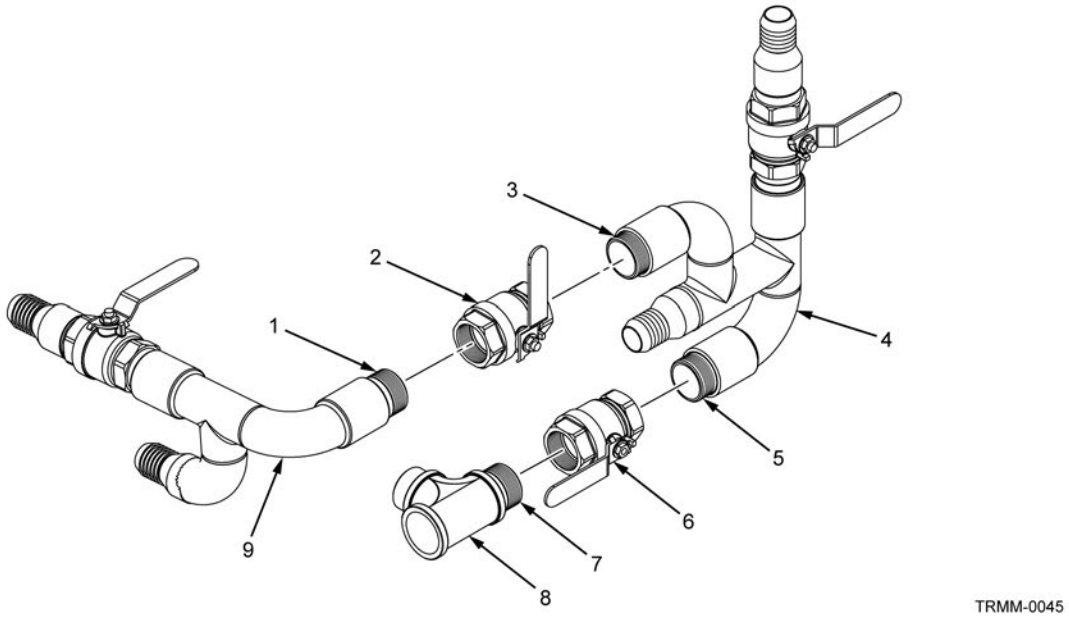


Figure 1. Removing Pump Discharge Ball Valve (V10/V11).

END OF TASK

CLEANING

WARNING

Solvent cleaning compound MIL-PRF-680 Type III is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Keep away from open flames and other sources of ignition. Failure to comply may cause injury to personnel.

1. Clean threads of all disassembled components. Remove all buildup of dirt, oil, and debris from threads.
2. Clean all metal parts with a cleaning cloth and solvent cleaning compound.
3. Allow parts to dry thoroughly.

END OF TASK

INSTALLATION

1. To install pump discharge ball valve (V10) (Figure 2, Item 6), perform the following steps:

INSTALLATION - Continued

WARNING

Thread sealing compound is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Failure to comply may cause injury to personnel.

CAUTION

Once tightened, do not turn connections counterclockwise. Air leaks will be created and can cause leaks. Damage to equipment could occur.

a. Apply thread sealing compound to all threads.

b. Loosely install nipple (Figure 2, Item 7) into tee (Figure 2, Item 8). Do not fully tighten.

c. Install tee (Figure 2, Item 8) on pump discharge ball valve (V10) (Figure 2, Item 6). Tighten the pump discharge ball valve (V10) (Figure 2, Item 6) using the hexagon between the pump discharge ball valve (V10) (Figure 2, Item 6) and tee (Figure 2, Item 8).

d. If nipple (Figure 2, Item 5) was removed, reinstall into left side piping assembly (Figure 2, Item 4). Do not fully tighten.

e. Install the pump discharge ball valve (V10) (Figure 2, Item 6) on the nipple (Figure 2, Item 5). Tighten the pump discharge ball valve (V10) (Figure 2, Item 6) and nipple (Figure 2, Item 5) at the hexagon between the pump discharge ball valve (V10) (Figure 2, Item 6) and left side piping assembly (Figure 2, Item 4).

2. To install ball valve (V11) (Figure 2, Item 2), perform the following steps:

WARNING

Thread sealing compound is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Failure to comply may cause injury to personnel.

CAUTION

Once tightened, do not turn connections counterclockwise. Air leaks will be created and can cause leaks. Damage to equipment could occur.

a. Apply thread sealing compound to all threads.

b. If necessary, loosely install nipple (Figure 2, Item 1) into the left side piping assembly (Figure 2, Item 9). Do not fully tighten.

c. Install ball valve (V11) (Figure 2, Item 2) on left side piping assembly (Figure 2, Item 9). Tighten the ball valve (V11) (Figure 2, Item 2) using the hexagon between the ball valve (Figure 2, Item 2) and left side piping assembly (Figure 2, Item 9).

d. If nipple (Figure 2, Item 3) was removed, reinstall into the left side piping assembly (Figure 2, Item 4). Do not fully tighten.

INSTALLATION - Continued

e. Install the ball valve (V11) (Figure 2, Item 2) and left side piping assembly (Figure 2, Item 9). Tighten the ball valve (V11) (Figure 2, Item 2) using the hexagon between the ball valve (V11) (Figure 2, Item 2) and left side piping assembly (Figure 2, Item 4).

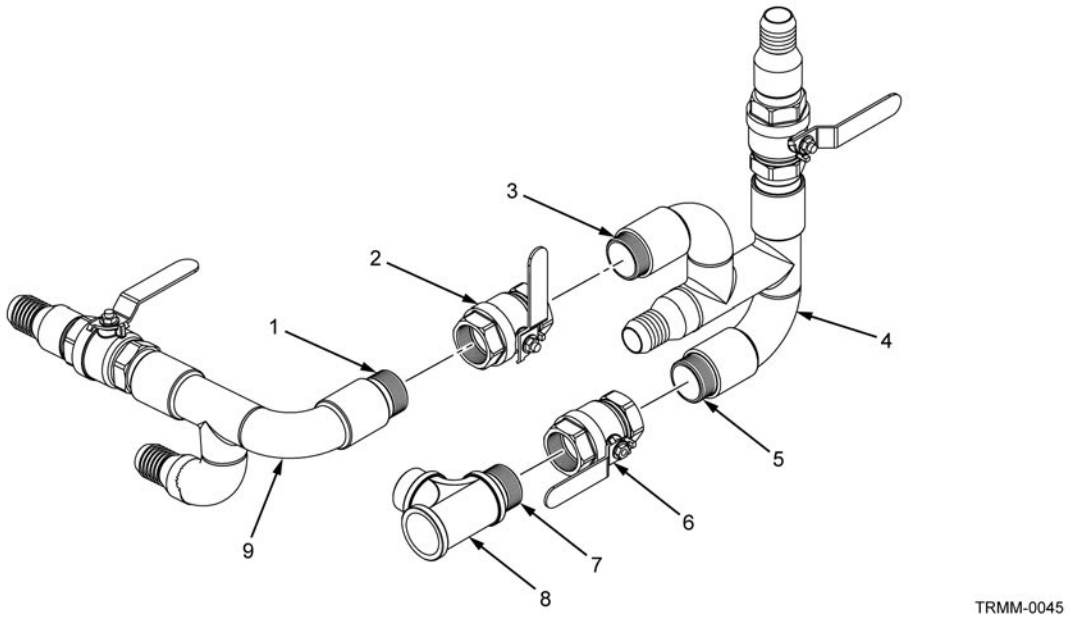


Figure 2. Installing Pump Discharge Ball Valve (V10) or Ball Valve (V11).

END OF TASK

FOLLOW-ON MAINTENANCE

1. Replace ball valve (V9) (WP 0085).
2. Install left side piping assembly (WP 0084).
3. Fill MFS TRM with fuel (TM 10-4930-371-10) and check for leaks.

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
METERED GRAVITY DISCHARGE BALL VALVE (V12) REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposable nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)
- Vise, machinist's (WP 0217, Table 1, Item 14)
- Wire brush (WP 0217, Table 1, Item 15)
- Wrench, adjustable, automotive (WP 0217, Table 1, Item 17)
- Wrench, internal pipe (WP 0217, Table 1, Item 18)
- Wrench, pipe, 18 inch (WP 0217, Table 1, Item 19)

Materials/Parts
- Absorbent material (WP 0216, Table 1, Item 1)
- Cleaning compound, solvent (WP 0216, Table 1, Item 3)
- Cloth, cleaning (WP 0216, Table 1, Item 4)
- Thread sealing compound (WP 0216, Table 1, Item 15)
- Ball Valve (WP 0177, Figure 31, Item 4)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer

References
- ATP 4-43
- TM 10-4930-371-10
- WP 0084

Equipment Condition
- MFS TRM grounded (TM 10-4930-371-10)
- Piping manifold evacuated (TM 10-4930-371-10)
- Left side piping assembly removed (WP 0084)
- (V12) ball valve placard removed (WP 0089)

Time to Complete
- 1.5 Hour(s)

REMOVAL

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Use a drip pan to collect leaking fuel. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.

1. Place left side piping assembly (Figure 1, Item 4) in vise.

REMOVAL - Continued

NOTE

Note orientation of hardware and components to aid in installation.

2. At the hexagon between the metered gravity discharge ball valve (V12) (Figure 1, Item 2) and left side piping assembly (Figure 1, Item 4), remove the hose barb (Figure 1, Item 1) and metered gravity discharge ball valve (V12) (Figure 1, Item 2) from left side piping assembly (Figure 1, Item 4).
3. If nipple (Figure 1, Item 3) is removed with metered gravity discharge ball valve (V12) (Figure 1, Item 2), remove nipple (Figure 1, Item 3) from metered gravity discharge ball valve (V12) (Figure 1, Item 2) and retain for installation.
4. At the hexagon between the gravity discharge ball valve (V12) (Figure 1, Item 2) and hose barb (Figure 1, Item 1), remove the metered gravity discharge ball valve (V12) (Figure 1, Item 2) from the hose barb (Figure 1, Item 1).

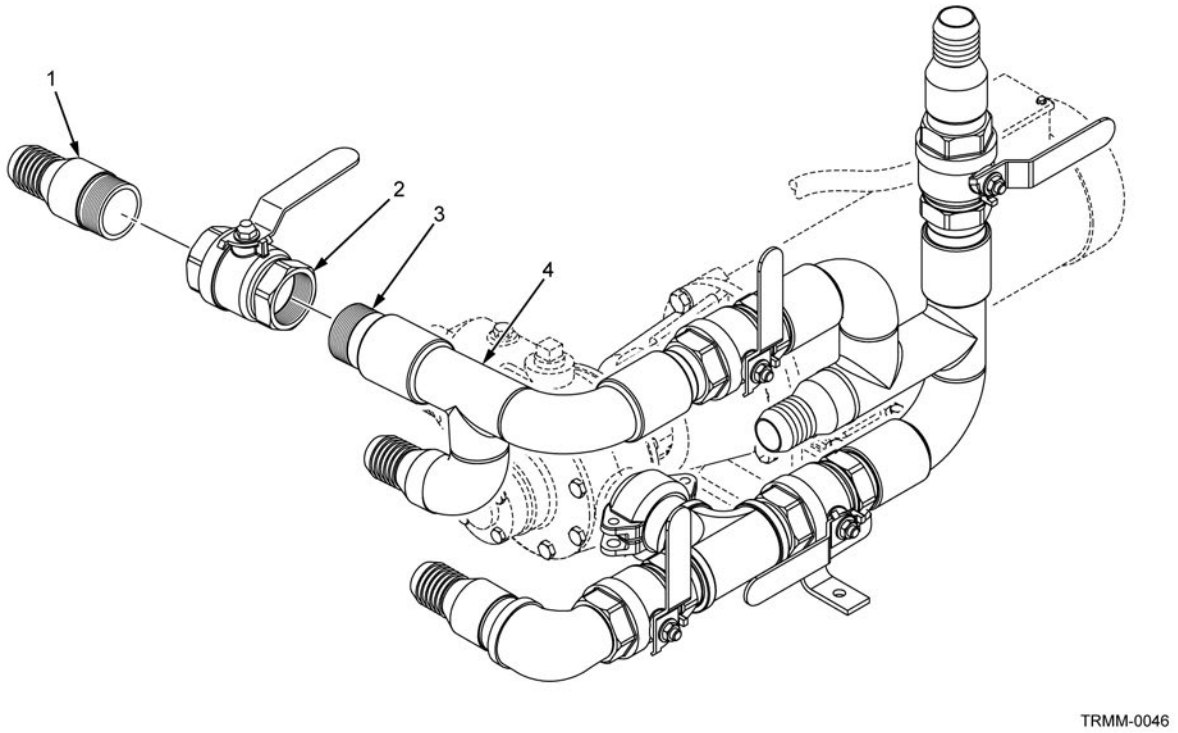


Figure 1. Removing Metered Gravity Discharge Ball Valve (V12).

END OF TASK

CLEANING

WARNING

Solvent cleaning compound MIL-PRF-680 Type III is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Keep away from open flames and other sources of ignition. Failure to comply may cause injury to personnel.

1. Clean threads of hose barb (Figure 1, Item 1) and nipple (Figure 1, Item 3). Remove all buildup of dirt, oil, and debris from threads.
2. Clean all metal parts with a cleaning cloth and solvent cleaning compound and allow parts to dry thoroughly.

END OF TASK

INSTALLATION

WARNING

Thread sealing compound is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Failure to comply may cause injury to personnel.

1. Apply thread sealing compound to all threads.
2. Install hose barb (Figure 2, Item 1) in new metered gravity discharge ball valve (V12) (Figure 2, Item 2). Tighten the metered gravity discharge ball valve (Figure 2, Item 2) using the hexagon between the metered gravity discharge ball valve (Figure 2, Item 2) and hose barb (Figure 2, Item 1).
3. If nipple (Figure 2, Item 3) was removed, reinstall into left side piping assembly (Figure 2, Item 4). Do not fully tighten.
4. Install metered gravity discharge ball valve (V12) (Figure 2, Item 2) on nipple (Figure 2, Item 3). Tighten the metered gravity discharge ball valve (Figure 2, Item 2) using the hexagon between the metered gravity discharge ball valve (Figure 2, Item 2) and nipple (Figure 2, Item 3).

INSTALLATION - Continued

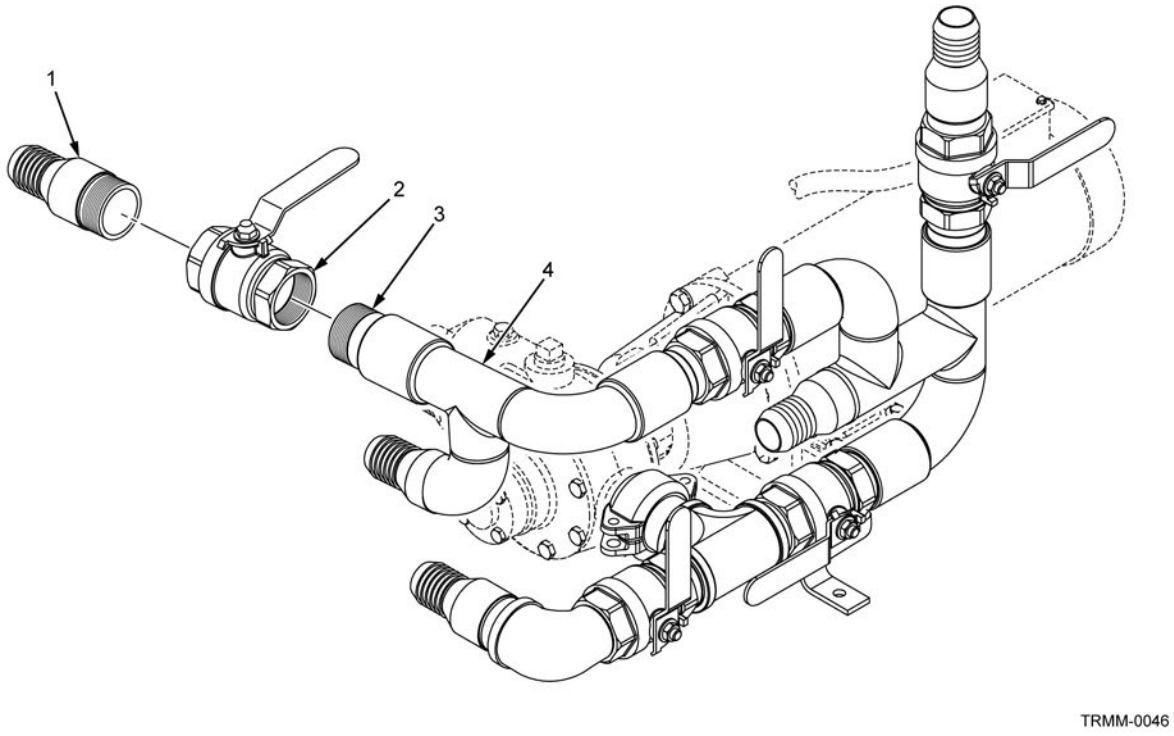


Figure 2. Replacing Metered Gravity Discharge Ball Valve (V12).

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install left side piping assembly (WP 0084).
2. Set up MFS TRM (TM 10-4930-371-10).
3. Check MFS TRM for leaks by recirculating fuel (TM 10-4930-371-10).

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
EVACUATION RETURN BALL VALVE (V15) REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposable nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)
- Vise, machinist's (WP 0217, Table 1, Item 14)
- Wire brush (WP 0217, Table 1, Item 15)
- Wrench, internal pipe (WP 0217, Table 1, Item 18)
- Wrench, adjustable, automotive (WP 0217, Table 1, Item 17)

Materials/Parts
- Absorbent material (WP 0216, Table 1, Item 1)
- Cleaning compound, solvent (WP 0216, Table 1, Item 3)
- Cloth, cleaning (WP 0216, Table 1, Item 4)
- Thread sealing compound (WP 0216, Table 1, Item 15)

Materials/Parts (cont.)
- Clamp, Hose (WP 0176, Figure 30, Item 2)
- Ball valve (WP 0177, Figure 31, Item 4)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer

References
- ATP 4-43
- TM 10-4930-371-10
- WP 0089

Equipment Condition
- MFS TRM grounded (TM 10-4930-371-10)
- MFS TRM piping manifold evacuated (TM 10-4930-371-10)
- (V15) placard mount removed (WP 0089)

Time to Complete
- 0.5 Hour(s)

REMOVAL

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Use a drip pan to collect leaking fuel. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.

REMOVAL - Continued

NOTE

Note orientation of hardware and components to aid in installation.

1. Remove hose clamp (Figure 1, Item 3) and flexible hose (Figure 1, Item 2) from hose barb (Figure 1, Item 1).
2. At hexagon between evacuation return ball valve (V15) (Figure 1, Item 4) and left side piping assembly (Figure 1, Item 6) remove hose barb (Figure 1, Item 1) and evacuation return ball valve (V15) (Figure 1, Item 4).
3. Place evacuation return ball valve (V15) (Figure 1, Item 4) in vise and remove hose barb (Figure 1, Item 1).
4. If nipple (Figure 1, Item 5) was removed with evacuation return ball valve (V15) (Figure 1, Item 4), remove nipple (Figure 1, Item 5) from evacuation return ball valve (V15) (Figure 1, Item 4) and retain for installation.

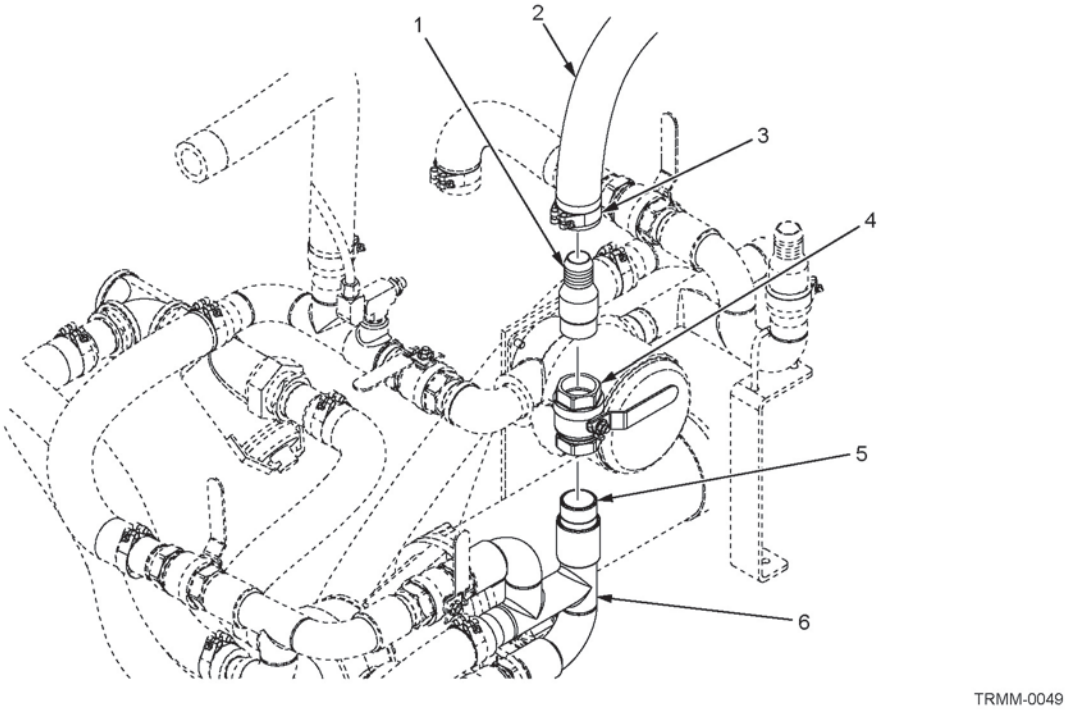


Figure 1. Replacing Evacuation Return Ball Valve (V15).

END OF TASK

CLEANING

WARNING

Solvent cleaning compound MIL-PRF-680 Type III is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Keep away from open flames and other sources of ignition. Failure to comply may cause injury to personnel.

1. Clean threads of hose barb (Figure 1, Item 1) and nipple (Figure 1, Item 5). Remove all buildup of dirt, oil, and debris from threads.
2. Clean all metal parts with a cleaning cloth and solvent cleaning compound.
3. Allow parts to dry thoroughly.

END OF TASK

INSTALLATION

WARNING

Thread sealing compound is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Failure to comply may cause injury to personnel.

1. Apply thread sealing compound to all threads.
2. Put evacuation ball valve (V15) (Figure 1, Item 4) in vise and install hose barb (Figure 1, Item 1). Tighten hose barb (Figure 1, Item 1).
3. If nipple (Figure 1, Item 5) was removed, reinstall on the left side piping assembly (Figure 1, Item 6). Do not fully tighten.
4. Install evacuation return ball valve (V15) (Figure 1, Item 4) on nipple (Figure 1, Item 5). Tighten the ball valve and nipple at the hexagon between the evacuation return ball valve (V15) (Figure 1, Item 4) and left side piping assembly (Figure 1, Item 6).
5. Install hose (Figure 1, Item 2) on hose barb (Figure 1, Item 1). Tighten hose clamp (Figure 1, Item 3).

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install (V15) placard mount (WP 0089).
2. Set up MFS TRM (TM 10-4930-371-10).

FOLLOW-ON MAINTENANCE - Continued

3. Check MFS TRM for leaks by recirculating fuel (TM 10-4930-371-10).

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
BALL VALVE PLACARD REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool kit, general mechanic's (WP 0217, Table 1, Item 13)

Materials/Parts
Nut, Self-Locking (LOCKNUTS) Qty: 2 (WP 0178, Figure 32, Item 6)
Nut, Self-Locking (LOCKNUTS) Qty: 2 (WP 0178, Figure 32, Item 14)
Marker, Identification (WP 0178, Figure 32, Item 3)
Marker, Identification (WP 0178, Figure 32, Item 10)

Personnel Required
91J Quartermaster and Chemical Equipment Repairer

Equipment Condition
MFS TRM grounded (TM 10-4930-371-10)
MFS TRM shut down (TM 10-4930-371-10)

Time to Complete
0.1 Hour(s)

REMOVAL

Remove two cap nuts (Figure 1, Item 7), two locknuts (Figure 1, Item 6), two nuts (Figure 1, Item 5), two flat washers (Figure 1, Item 4), placard (Figure 1, Items 3 or 8), placard support (Figure 1, Item 2), and U-bolt (Figure 1, Item 1). Discard locknuts.

END OF TASK

INSTALLATION

Install placard (Figure 1, Items 3 or 8), U-bolt (Figure 1, Item 1), placard support (Figure 1, Item 2), two flat washers (Figure 1, Item 4), two nuts (Figure 1, Item 5), two new locknuts (Figure 1, Item 6), and two cap nuts (Figure 1, Item 7).

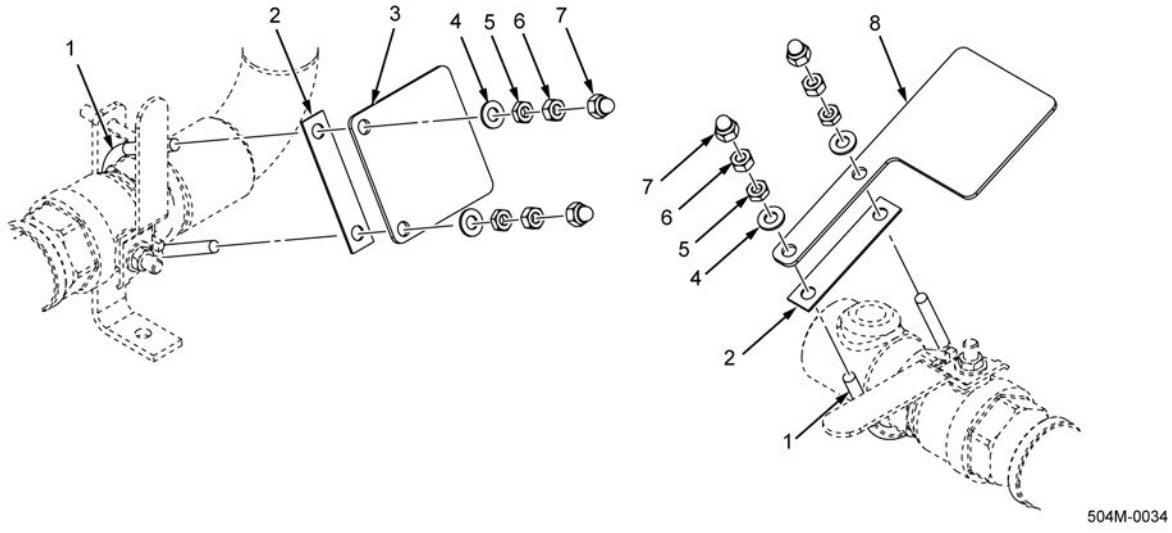


Figure 1. Replacing Ball Valve Placards.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install data plate (WP 0142).
2. Set up MFS TRM (TM 10-4930-371-10).

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
DISCHARGE PORT B CONTROL VALVE (V4) REPAIR

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposable nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)
- Pan, drip (WP 0217, Table 1, Item 8)
- Wrench, torque, click, ratcheting, 3/8 inch drive, 20 to 100 lb-ft. (WP 0217, Table 1, Item 23)

Materials/Parts
- Absorbent material (WP 0216, Table 1, Item 1)
- Cleaning compound, solvent (WP 0216, Table 1, Item 3)
- Cloth, cleaning (WP 0216, Table 1, Item 4)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer (2)

References
- ATP 4-43
- TM 10-4930-371-10

Equipment Condition
- MFS TRM grounded (TM 10-4930-371-10)
- MFS TRM drained (TM 10-4930-371-10)

Time to Complete
- 1.5 Hour(s)

DISASSEMBLY

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Failure to comply could result in injury or death to personnel.

NOTE

Note orientation of hardware and components to aid in installation.

1. Remove vapor recovery line dust cap (Figure 1, Item 2).
2. Momentarily open then close bottom loading valve (V1) (Figure 1, Item 1) to vent tank pressure.

DISASSEMBLY - Continued

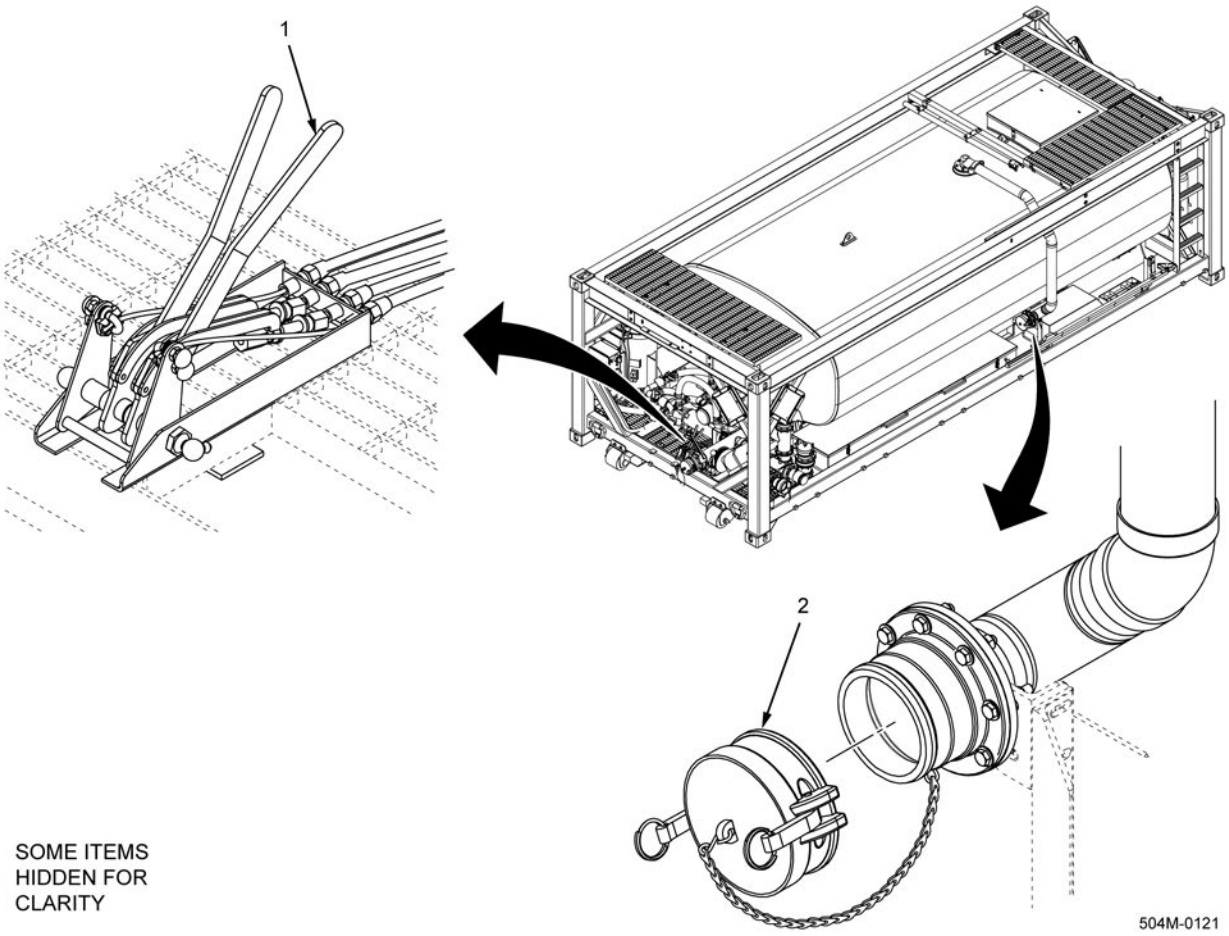


Figure 1. Fuel System Venting.

3. Place drip pan or suitable container under discharge port B control valve (V4) to catch residual fuel.
4. Remove bolt (Figure 2, Item 14), two flat washers (Figure 2, Item 8), grating clasp (Figure 2, Item 11), and locknut (Figure 2, Item 10) to release bracket (Figure 2, Item 13) from grate (Figure 2, Item 12). Discard locknut.
5. Remove two locknuts (Figure 2, Item 1) and remove bracket (Figure 2, Item 13). Discard locknuts.
6. Remove two nuts (Figure 2, Item 9), two flat washers (Figure 2, Item 8), and two bolts (Figure 2, Item 4).
7. Remove six locknuts (Figure 2, Item 1) and six bolts (Figure 2, Item 4) and remove camlock coupling (Figure 2, Item 5) and butterfly valve assembly (Figure 2, Item 3). Discard locknuts.
8. Remove dust plug (Figure 2, Item 7) and inspect gasket (Figure 2, Item 6). Discard gasket if damaged.
9. If necessary, separate camlock coupling (Figure 2, Item 5) from butterfly valve assembly (Figure 2, Item 3).
10. Remove any residual gasket material from mating surfaces of pipe flange.
11. Remove drip pan and dispose of fuel IAW unit SOP.

DISASSEMBLY - Continued

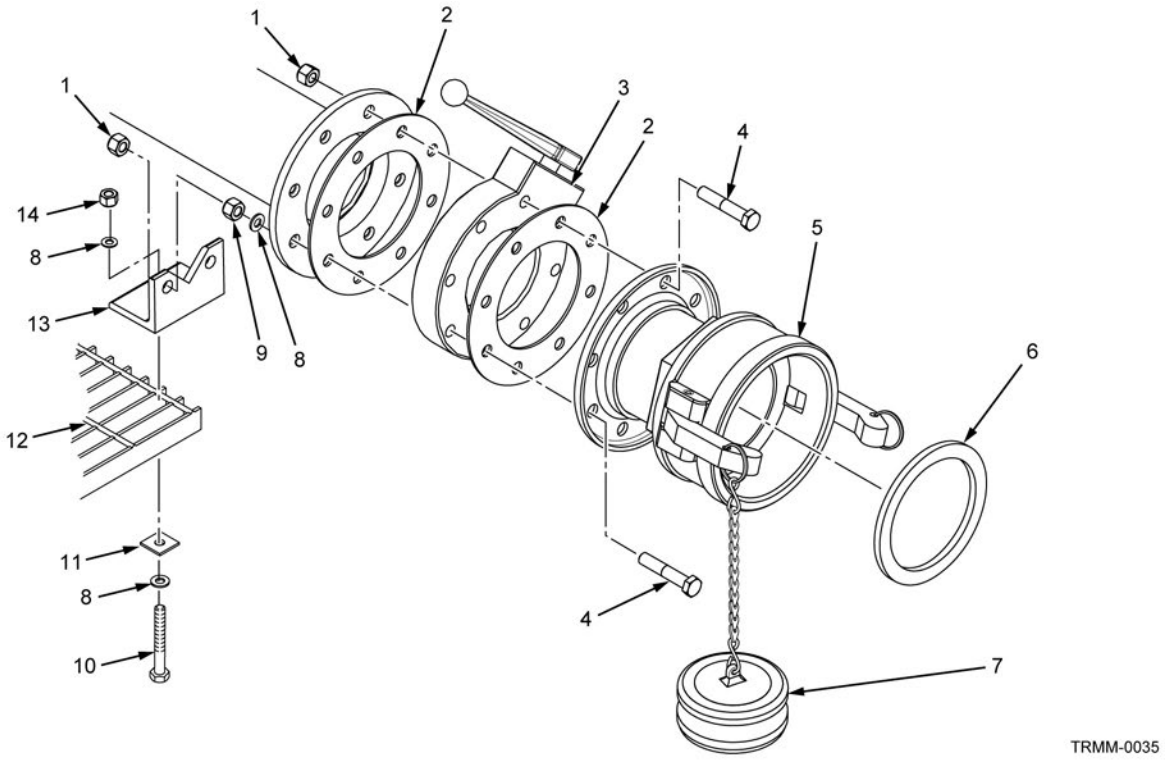


Figure 2. Replacing Discharge Port B Control Valve (V4).

END OF TASK

CLEANING

WARNING

Solvent cleaning compound MIL-PRF-680 Type III is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Keep away from open flames and other sources of ignition. Failure to comply may cause injury to personnel.

1. Remove all buildup of dirt, oil, and debris from all mating surfaces and clamping areas with cleaning solvent.
2. Allow parts to dry thoroughly.

END OF TASK

ASSEMBLY

NOTE

Ensure butterfly valve assembly is oriented with valve handle at top when installed.

ASSEMBLY - Continued

1. Install top two bolts (Figure 2, Item 4) into flange on camlock coupling assembly (Figure 2, Item 5).
2. Install two gaskets (Figure 2, Item 2), butterfly valve assembly (Figure 2, Item 3), onto camlock coupling assembly (Figure 2, Item 5).
3. Install camlock coupling assembly (Figure 2, Item 5) and butterfly valve assembly (Figure 2, Item 3) onto discharge pipe flange.
4. Loosely install two new locknuts (Figure 2, Item 1) onto bolts (Figure 2, Item 4).
5. In bottom of camlock coupling assembly, loosely install two bolts (Figure 2, Item 4), two flat washers (Figure 2, Item 8) and two nuts (Figure 2, Item 9).
6. Loosely install remaining bolts (Figure 2, Item 4) and new locknuts (Figure 2, Item 1) on sides of camlock coupling assembly.
7. Install bracket (Figure 2, Item 13) on bottom two bolts (Figure 2, Item 4).
8. Tighten all bolts and torque to 35 ft-lb in standard sequence as shown in Figure 3.
9. Secure bracket (Figure 2, Item 13) on bottom two bolts (Figure 2, Item 4) with two new locknuts (Figure 2, Item 1).
10. Secure bracket (Figure 2, Item 13) to grating (Figure 2, Item 12) with bolt (Figure 2, Item 10), two flat washers (Figure 2, Item 8), grating clasp (Figure 2, Item 11) and new locknut (Figure 2, Item 14).
11. If necessary, install new gasket (Figure 2, Item 6).
12. Install dust plug (Figure 2, Item 7).

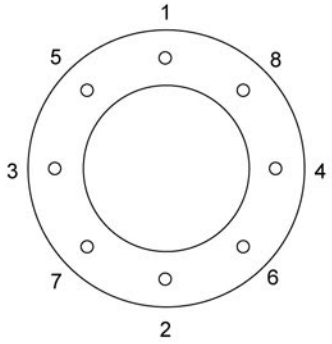


Figure 3. Bolt Tightening Sequence.

13. Install vapor recovery line dust cap (Figure 4, Item 1).

ASSEMBLY - Continued

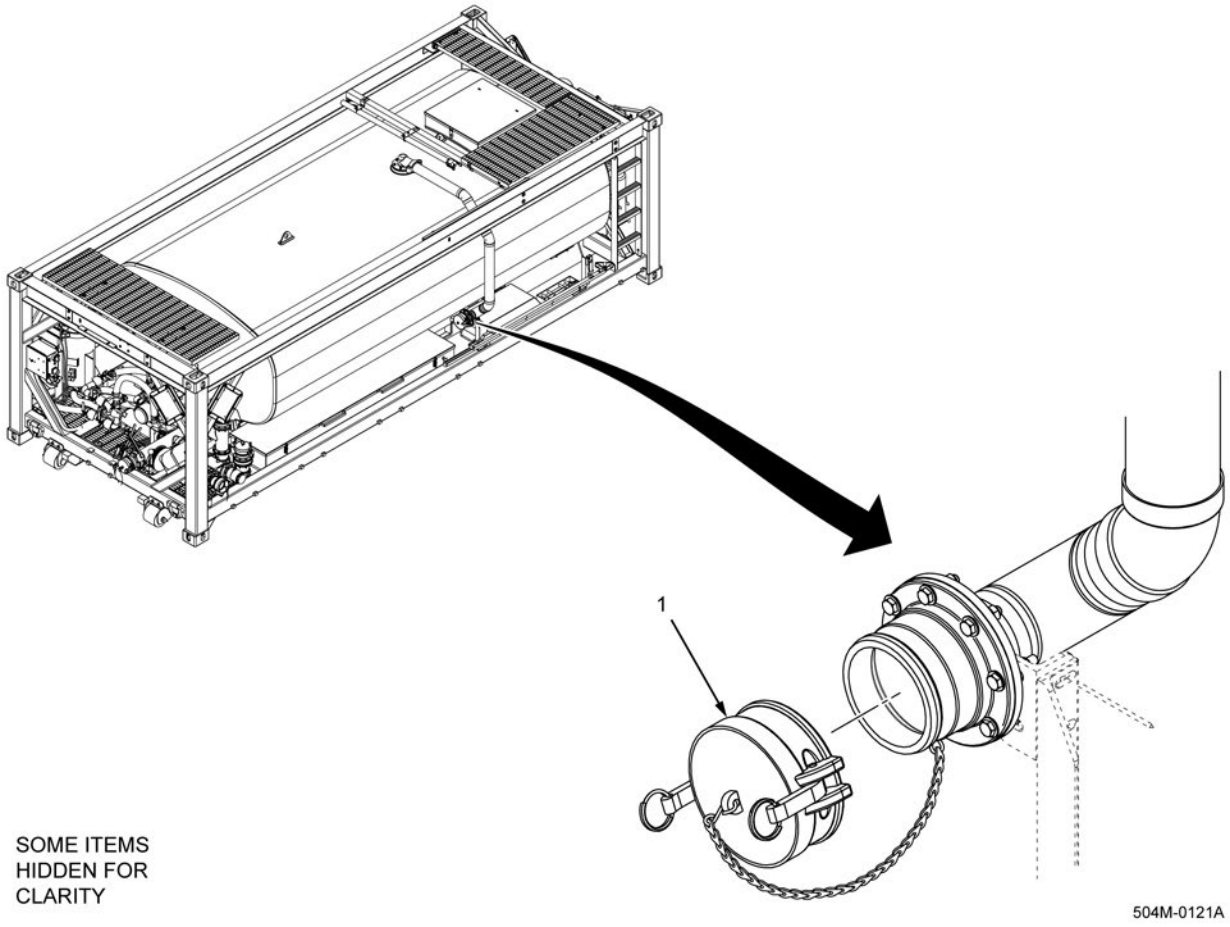


Figure 4. Installing Vapor Recovery Line Dust Cap.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Set up MFS TRM (TM 10-4930-371-10).
2. Check MFS TRM for leaks by recirculating fuel (TM 10-4930-371-10).

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
DISCHARGE PORT G CONTROL VALVE (V3) REPAIR

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposable nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)
- Pan, drip (WP 0217, Table 1, Item 8)
- Wrench, torque, click, ratcheting, 3/8 inch drive, 20 to 100 lb-ft. (WP 0217, Table 1, Item 23)

Materials/Parts
- Absorbent material (WP 0216, Table 1, Item 1)
- Cloth, cleaning (WP 0216, Table 1, Item 4)
- Cleaning compound, solvent (WP 0216, Table 1, Item 3)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer (2)

References
- ATP 4-43
- TM 10-4930-371-10

Equipment Condition
- MFS TRM grounded (TM 10-4930-371-10)
- MFS TRM shut down (TM 10-4930-371-10)
- MFS TRM drained (TM 10-4930-371-10)

Time to Complete
- 1.0 Hour(s)

DISASSEMBLY

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Failure to comply could result in injury or death to personnel.

DISASSEMBLY - Continued

1. Remove vapor recovery line dust cap (Figure 1, Item 2).
2. Momentarily open then close (V1) bottom loading valve (Figure 1, Item 1) to vent tank pressure.

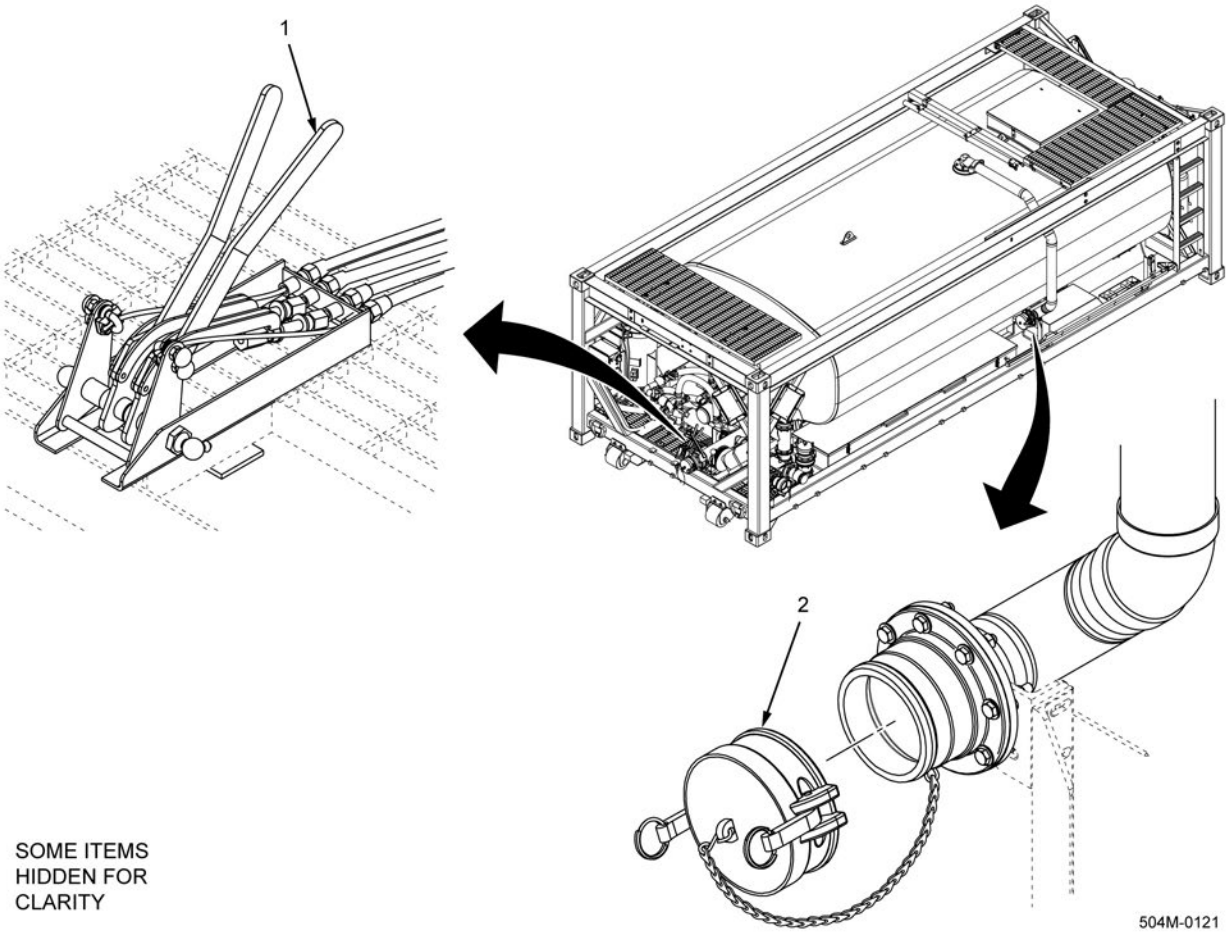


Figure 1. Vapor Recovery Line Dust Cap.

3. Place drip pan under camlock coupling (Figure 2, Item 5).
4. Remove dust plug (Figure 2, Item 7) and slowly open butterfly valve (Figure 2, Item 3) to drain residual fuel. Reinstall dust plug (Figure 2, Item 7).
5. Remove eight locknuts (Figure 2, Item 1) and bolts (Figure 2, Item 4) securing camlock coupling (Figure 2, Item 5) and butterfly valve assembly (Figure 2, Item 3) to pipe flange (Figure 2, Item 8). Discard locknuts.
6. Separate camlock coupling (Figure 2, Item 5) and butterfly valve assembly (Figure 2, Item 3) from pipe flange (Figure 2, Item 8).
7. Remove two gaskets (Figure 2, Item 2) from pipe flange (Figure 2, Item 8) and butterfly valve assembly (Figure 2, Item 3). Discard gaskets.
8. Inspect gasket (Figure 2, Item 6) in camlock coupling (Figure 2, Item 5) and discard gasket if damaged.
9. Remove drip pan and dispose of fuel IAW unit SOP.

DISASSEMBLY - Continued

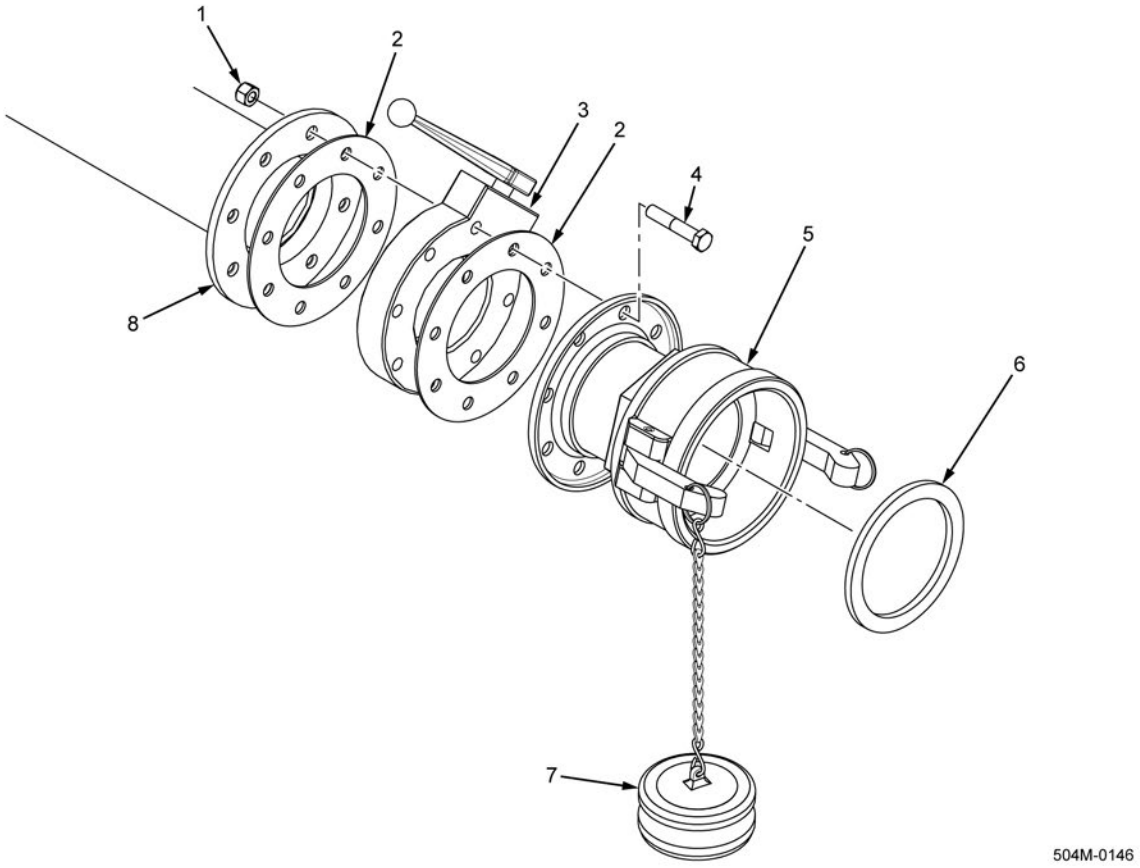


Figure 2. Replacing Discharge Port G Control Valve (V3).

END OF TASK

CLEANING

WARNING

Solvent cleaning compound MIL-PRF-680 Type III is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Keep away from open flames and other sources of ignition. Failure to comply may cause injury to personnel.

1. Remove all buildup of dirt, oil, and debris from all mating surfaces and clamping areas.
2. Remove any residual gasket material from mating surfaces of pipe and flange.

CLEANING - Continued

3. Allow parts to dry thoroughly.

END OF TASK

ASSEMBLY

1. Assemble two new gaskets (Figure 2, Item 2), new butterfly valve assembly (Figure 2, Item 3) onto camlock coupling (Figure 2, Item 5) and secure with eight bolts (Figure 2, Item 4) through assembled parts.
2. Position assembled gasket (Figure 2, Item 2), new butterfly valve assembly (Figure 2, Item 3), and camlock coupling (Figure 2, Item 5) on pipe flange (Figure 2, Item 8), aligning mounting holes.
3. Secure eight bolts (Figure 2, Item 4) with new locknuts (Figure 2, Item 1).
4. Tighten eight locknuts (Figure 2, Item 1). Torque to 35 ft-lbs in sequence shown in Figure 3.

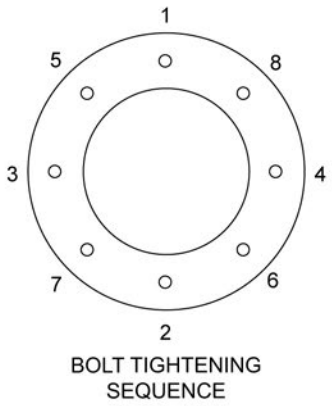


Figure 3. Eight Bolt Torque Sequence.

5. Install vapor recovery line dust cap (Figure 4, Item 1).

ASSEMBLY - Continued

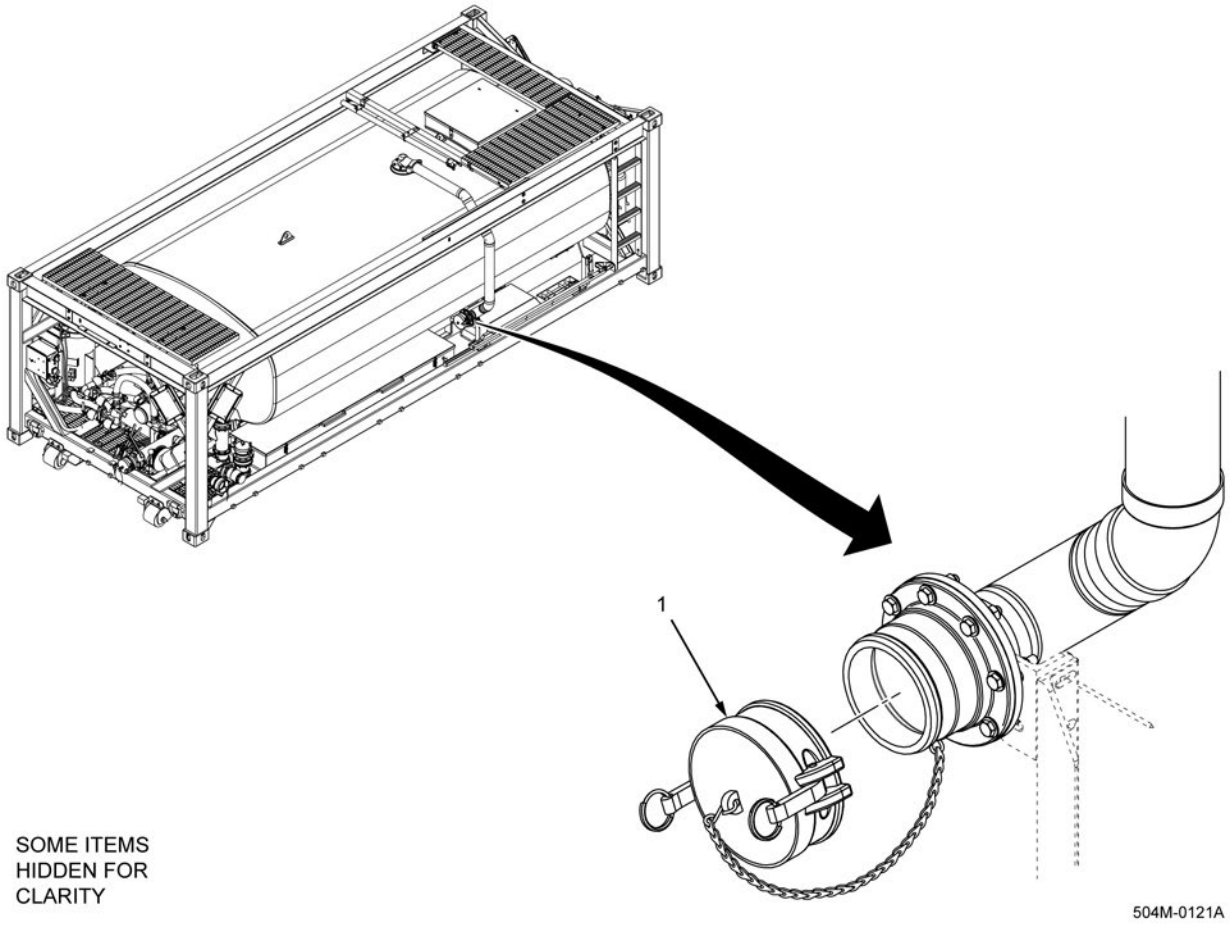


Figure 4. Installing Vapor Recovery Line Dust Cap.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Set up MFS TRM (TM 10-4930-371-10).
2. Check MFS TRM for leaks by recirculating fuel (TM 10-4930-371-10).

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
DISCHARGE PORT A CONTROL VALVE (V5) REPAIR

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposable nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)
- Pan, drip (WP 0217, Table 1, Item 8)
- Wrench, torque, click, ratcheting, 3/8 inch drive, 20 to 100 lb-ft. (WP 0217, Table 1, Item 23)

Materials/Parts
- Absorbent material (WP 0216, Table 1, Item 1)
- Cleaning compound, solvent (WP 0216, Table 1, Item 3)
- Cloth, cleaning (WP 0216, Table 1, Item 4)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer

References
- ATP 4-43
- TM 10-4930-371-10

Equipment Condition
- MFS TRM grounded (TM 10-4930-371-10)
- MFS TRM shut down (TM 10-4930-371-10)
- MFS TRM drained (TM 10-4930-371-10)

Time to Complete
- 1.5 Hour(s)

DISASSEMBLY

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Failure to comply could result in injury or death to personnel.

NOTE

Note orientation of hardware and components to aid in installation.

1. Remove vapor recovery line dust cap (Figure 1, Item 2).
2. Momentarily open then close bottom loading valve (V1) (Figure 1, Item 1) to vent tank pressure.

DISASSEMBLY - Continued

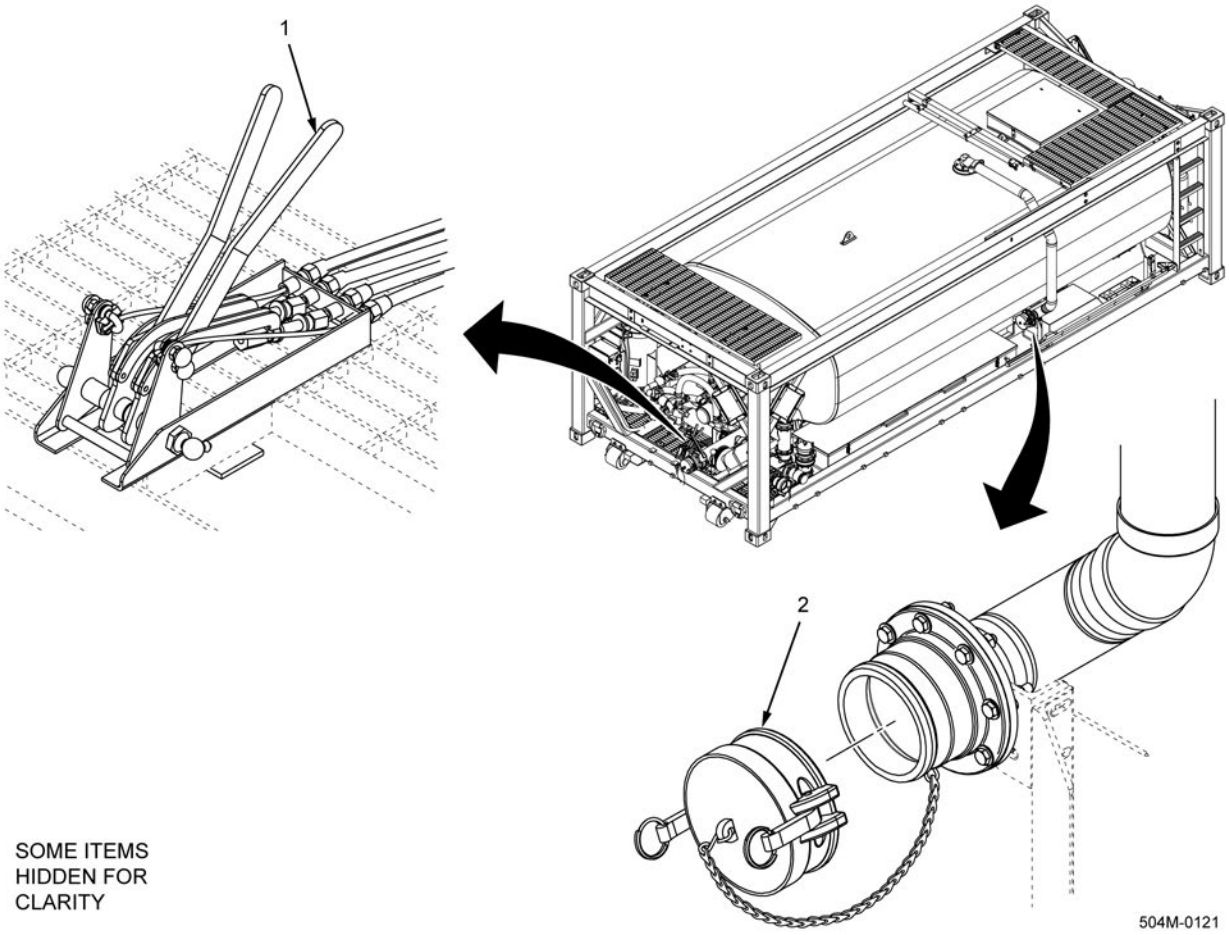


Figure 1. Fuel System Venting.

3. Place drip pan under valve.
4. Remove dust cap (Figure 2, Item 13). Slowly open and close butterfly valve (Figure 2, Item 4) to drain residual fuel.
5. Remove bolt (Figure 2, Item 7), two flat washers (Figure 2, Item 8), grating clasp (Figure 2, Item 10), and locknut (Figure 2, Item 11) to release bracket (Figure 2, Item 9) from grate. Discard locknut.
6. Remove two locknuts (Figure 2, Item 6) and remove bracket (Figure 2, Item 9). Discard locknuts.
7. Remove two nuts (Figure 2, Item 12), flat washers (Figure 2, Item 8), and bolts (Figure 2, Item 14).
8. Remove six locknuts (Figure 2, Item 6), and bolts (Figure 2, Item 1). Discard locknuts.
9. Separate D1 adapter coupling (Figure 2, Item 2) from discharge pipe flange (Figure 2, Item 5).
10. Remove drip pan and dispose of fuel in IAW local unit SOP.

END OF TASK

CLEANING

WARNING

Solvent cleaning compound MIL-PRF-680 Type III is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Keep away from open flames and other sources of ignition. Failure to comply may cause injury to personnel.

1. Remove any residual gasket material from mating surfaces of pipe flange.
2. Remove all buildup of dirt, oil, and debris from all mating surfaces and clamping areas with cleaning solvent.
3. Allow parts to dry thoroughly.

END OF TASK

ASSEMBLY

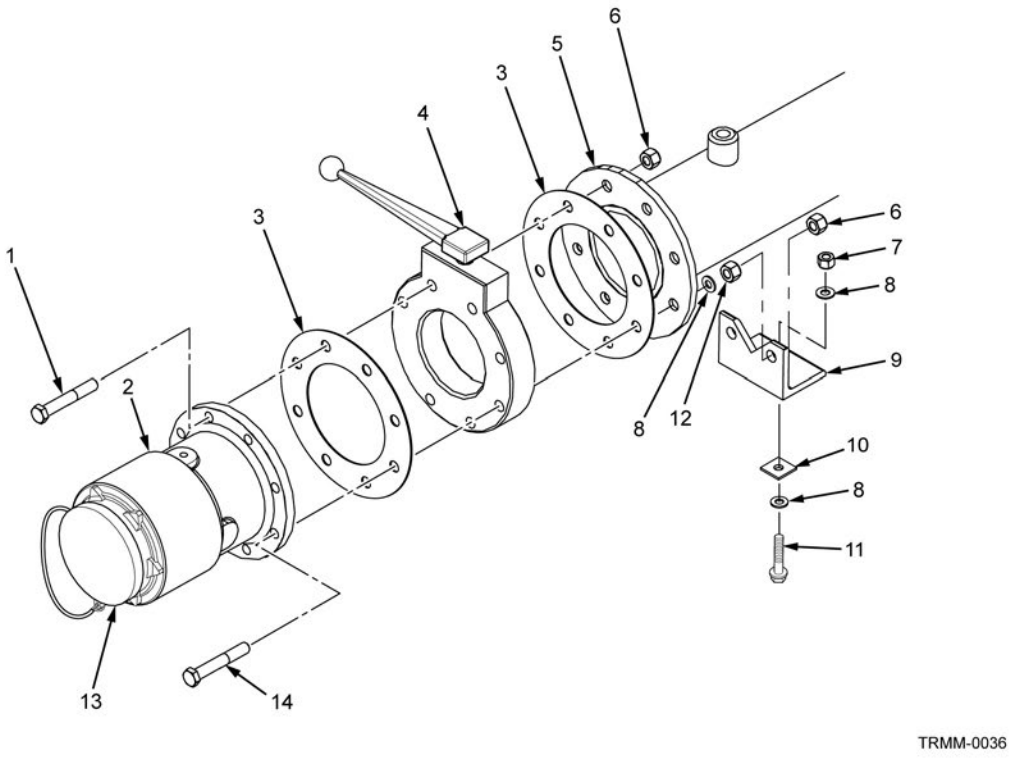


Figure 2. Replacing Control Valve (V5).

1. Install two top bolts (Figure 2, Item 1) in D1 adapter coupling (Figure 2, Item 2).

ASSEMBLY - Continued

2. Install new gasket (Figure 2, Item 3) on butterfly valve assembly (Figure 2, Item 4), and new gasket (Figure 2, Item 3) on D1 adapter coupling (Figure 2, Item 2).
3. Install butterfly valve assembly (Figure 2, Item 4) and D1 adapter coupling (Figure 2, Item 2) on discharge pipe flange (Figure 2, Item 5).
4. Loosely install two new locknuts (Figure 2, Item 6) on bolts (Figure 2, Item 1).
5. Loosely install two bolts (Figure 2, Item 14), two flat washers (Figure 2, item 8) and two nuts (Figure 2, Item 12) on bottom of D1 adapter coupling (Figure 2, Item 2).
6. Loosely install four bolts (Figure 2, Item 1) and new locknuts (Figure 2, Item 6) on sides of D1 adapter coupling (Figure 2, Item 2).
7. Tighten then torque all bolts to 35 ft-lb in standard sequence as shown in Figure 3.

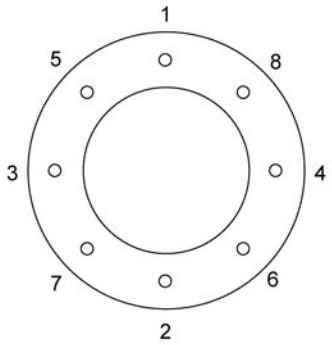


Figure 3. Bolt Tightening Sequence.

8. Install bracket (Figure 2, Item 9) on bottom two bolts (Figure 2, Item 1) and secure with two new locknuts (Figure 2, Item 6).
9. Secure bracket (Figure 2, Item 9) to grating with bolt (Figure 2, Item 7), flat washer (Figure 2, Item 8), grating clasp (Figure 2, Item 10), flat washer and new locknut (Figure 2, Item 11).
10. Install dust cap (Figure 2, Item 13).
11. Install vapor recovery line dust cap (Figure 4, Item 1).

ASSEMBLY - Continued

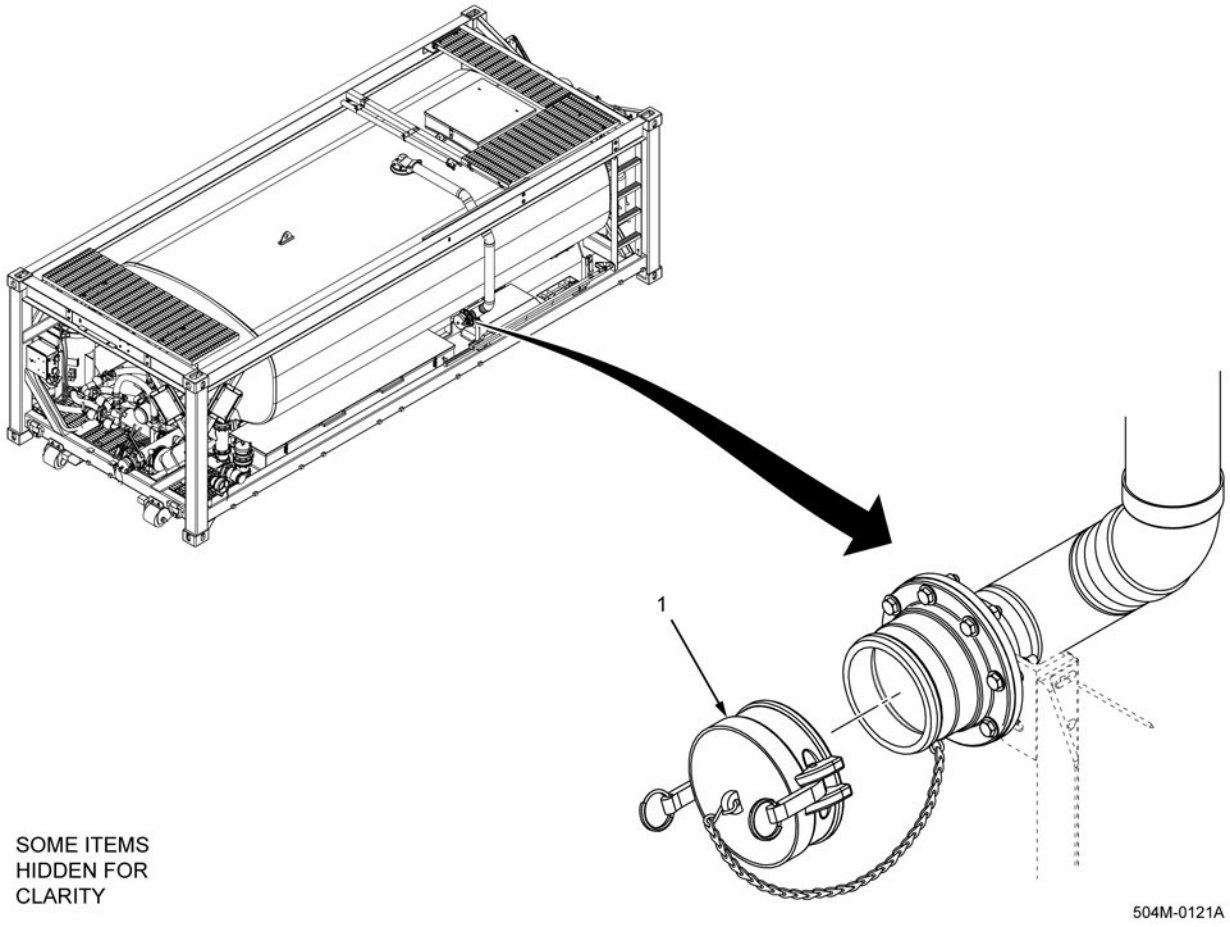


Figure 4. Installing Vapor Recovery Line Dust Cap.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Set up MFS TRM (TM 10-4930-371-10).
2. Check MFS TRM for leaks by recirculating fuel (TM 10-4930-371-10).

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
DISCHARGE PORT C CONTROL VALVE (V6) REPAIR

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposable nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)
- Pan, drip (WP 0217, Table 1, Item 8)
- Wrench, torque, click, ratcheting, 3/8 inch drive, 20 to 100 lb-ft. (WP 0217, Table 1, Item 23)

Materials/Parts
- Absorbent material (WP 0216, Table 1, Item 1)
- Cleaning compound, solvent (WP 0216, Table 1, Item 3)
- Cloth, Cleaning (WP 0216, Table 1, Item 4)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer

References
- ATP 4-43
- TM 10-4930-371-10

Equipment Condition
- MFS TRM grounded (TM 10-4930-371-10)
- MFS TRM shut down (TM 10-4930-371-10)
- MFS TRM drained (TM 10-4930-371-10)

Time to Complete
- 1.5 Hour(s)

DISASSEMBLY

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Failure to comply could result in injury or death to personnel.

NOTE

Note orientation of hardware and components to aid in installation.

1. Remove vapor recovery line dust cap (Figure 1, Item 2).
2. Momentarily open then close bottom loading valve (V1) (Figure 1, Item 1) to vent tank pressure.

DISASSEMBLY - Continued

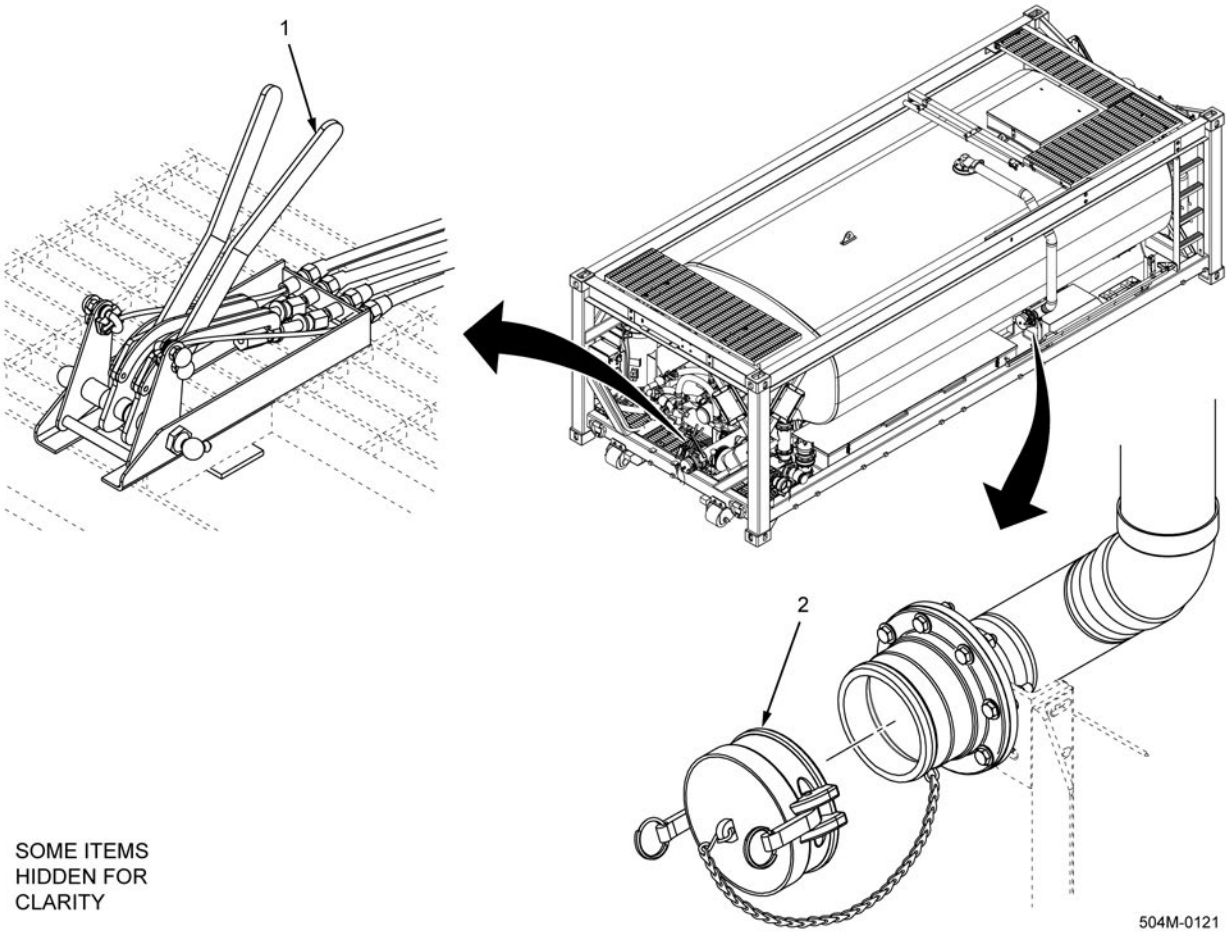


Figure 1. Fuel System Venting.

3. Place drip pan under port C valve to catch residual fuel.
4. Remove dust cap (Figure 2, Item 1).
5. Remove eight locknuts (Figure 2, Item 8) and bolts (Figure 2, Item 3). Discard locknuts.
6. Separate flanged camlock coupling (Figure 2, Item 4), spacer (Figure 2, Item 6), gaskets (Figure 2, Items 5) and butterfly valve (Figure 2, Item 9) from discharge pipe flange (Figure 2, Item 7).
7. Inspect gasket (Figure 2, Item 2). Discard if damaged.
8. Remove drip pan and dispose of fuel IAW unit SOP.

DISASSEMBLY - Continued

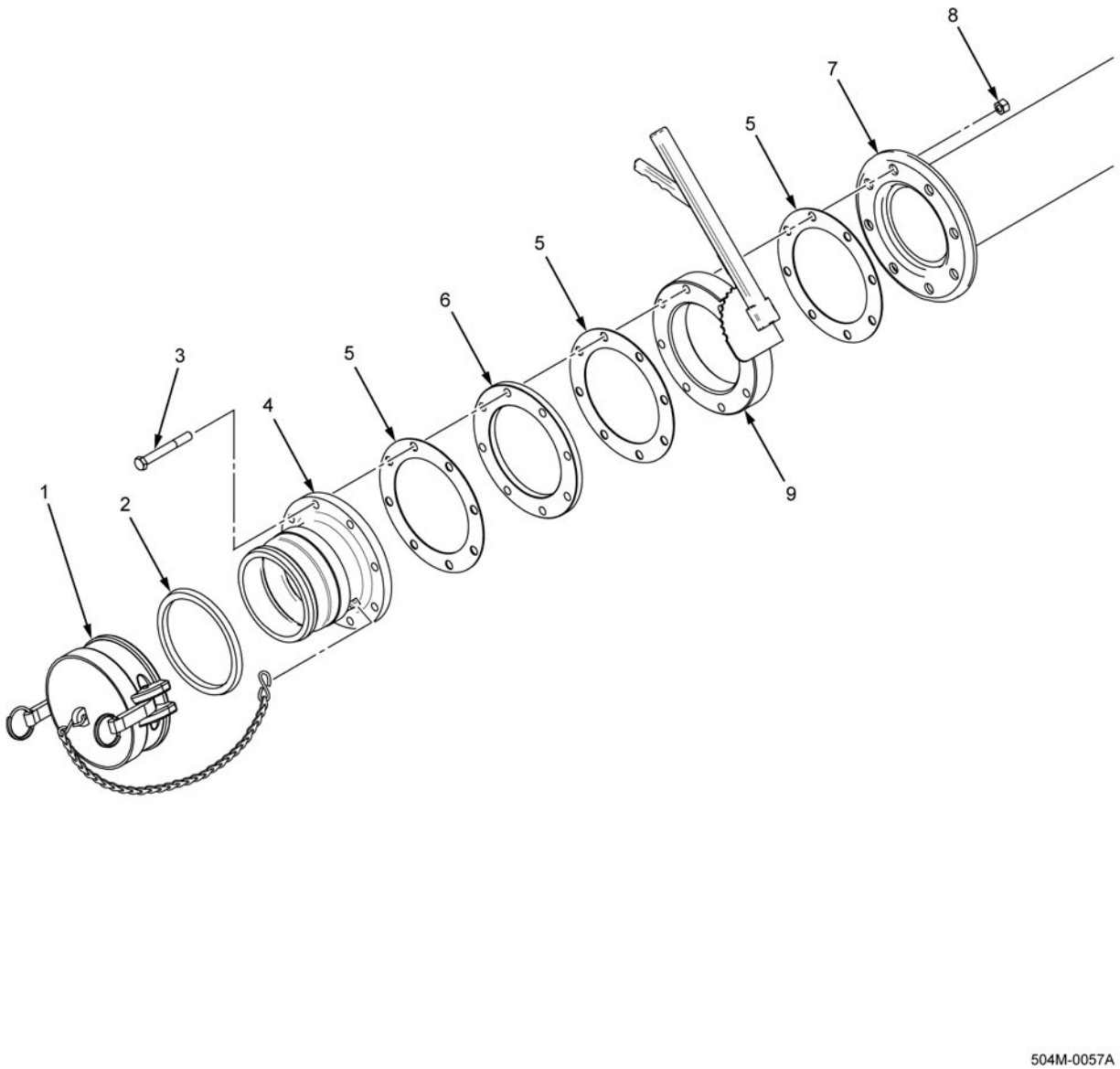


Figure 2. Replacing Discharge Port C Control Valve (V6).

END OF TASK

CLEANING

WARNING

Solvent cleaning compound MIL-PRF-680 Type III is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Keep away from open flames and other sources of ignition. Failure to comply may cause injury to personnel.

1. Remove any residual gasket material from mating surfaces of valve assembly and pipe flange.
2. Remove all buildup of dirt, oil, and debris from all mating surfaces and clamping areas.
3. Allow parts to dry thoroughly.

END OF TASK

ASSEMBLY

1. Assemble new gaskets (Figure 2, Item 5), port camlock coupling (Figure 2, Item 4), spacer (Figure 2, Item 6), and butterfly valve assembly (Figure 2, Item 9).
2. Install two bolts (Figure 2, Item 3), in top two holes of camlock coupling (Figure 2, Item 4) and install on discharge pipe flange (Figure 2, Item 7).
3. If necessary, install new gasket (Figure 2, Item 2) and dust cap (Figure 2, Item 1).
4. Loosely install two new locknuts (Figure 2, Item 8).
5. Loosely install six bolts (Figure 2, Item 3) and new locknuts (Figure 2, Item 8).
6. Tighten eight locknuts (Figure 2, Item 8) and torque to 35 ft-lb in standard torque sequence as shown in Figure 3.
7. Install vapor recovery line dust cap (Figure 4, Item 1).

ASSEMBLY - Continued

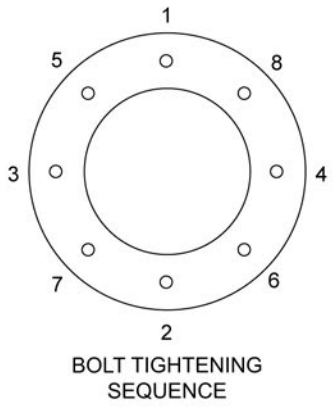


Figure 3. Standard Tightening Sequence.

ASSEMBLY - Continued

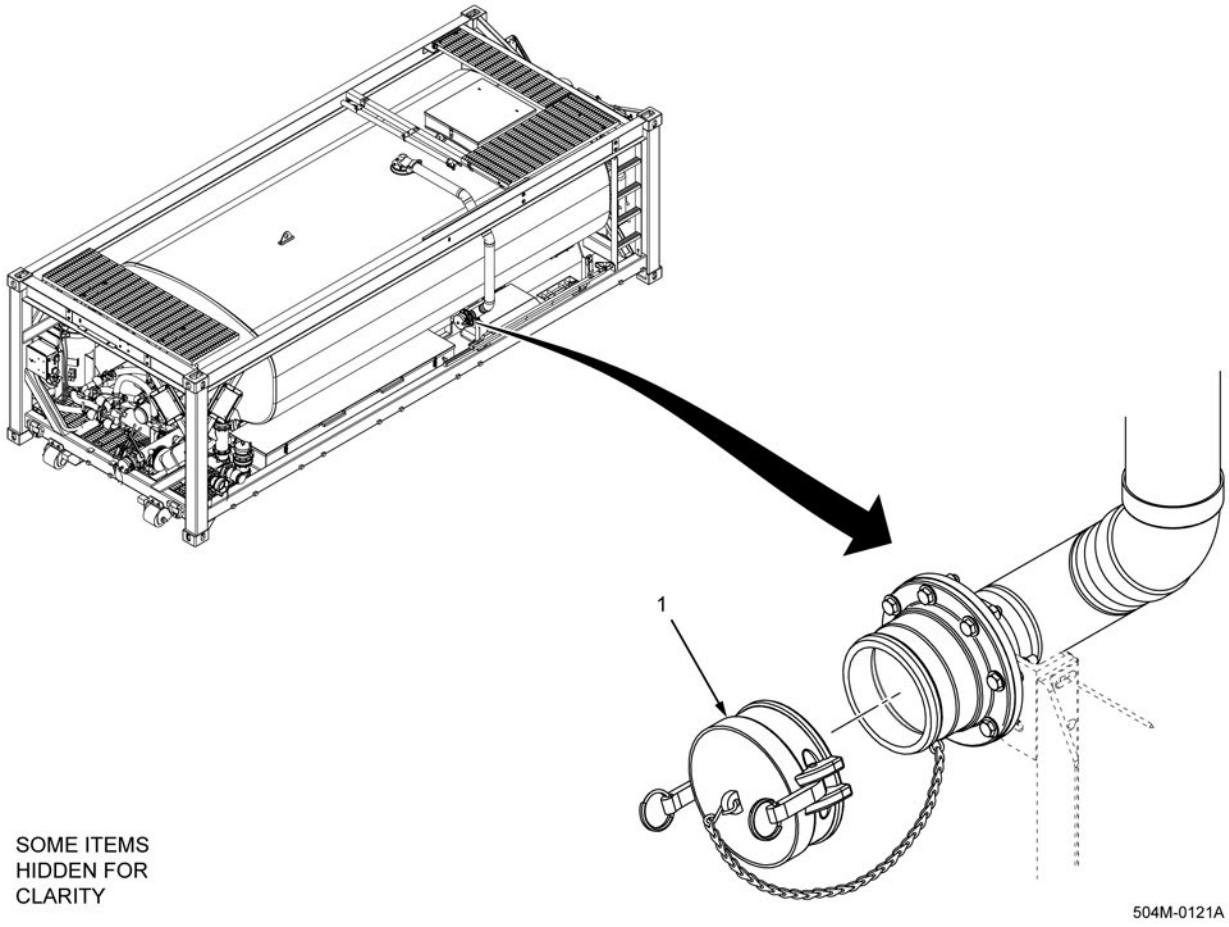


Figure 4. Installing Vapor Recovery Line Dust Cap.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Set up MFS TRM (TM 10-4930-371-10).
2. Check MFS TRM for leaks by recirculating fuel (TM 10-4930-371-10).

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
VALVED DRYBREAK PORT D/E CONTROL VALVES (V7/V8) REPAIR

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposable nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)
- Vise, machinist's (WP 0217, Table 1, Item 14)

Materials/Parts
- Absorbent material (WP 0216, Table 1, Item 1)
- Cleaning compound, solvent (WP 0216, Table 1, Item 3)
- Cloth, cleaning (WP 0216, Table 1, Item 4)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer

References
- WP 0095

Equipment Condition
- MFS TRM shut down (TM 10-4930-371-10)
- MFS TRM grounded (TM 10-4930-371-10)
- Port D (V7) or Port E (V8) drybreak coupling removed (WP 0095)

Time to Complete
- 1 Hour(s)

DISASSEMBLY

1. Place port D (V7) or port E (V8) dry break coupling (Figure 1, Item 5) in vise.
2. Remove dust cap (Figure 1, Item 2) from port D (V7) or port E (V8) dry break coupling (Figure 1, Item 5).
3. Remove seal (Figure 1, Item 3) from dust cap (Figure 1, Item 2). Discard dust cap seal.
4. Remove cap (Figure 1, Item 2) lanyard (Figure 1, Item 1), and split ring (Figure 1, Item 6) from coupling (Figure 1, Item 5).

DISASSEMBLY - Continued

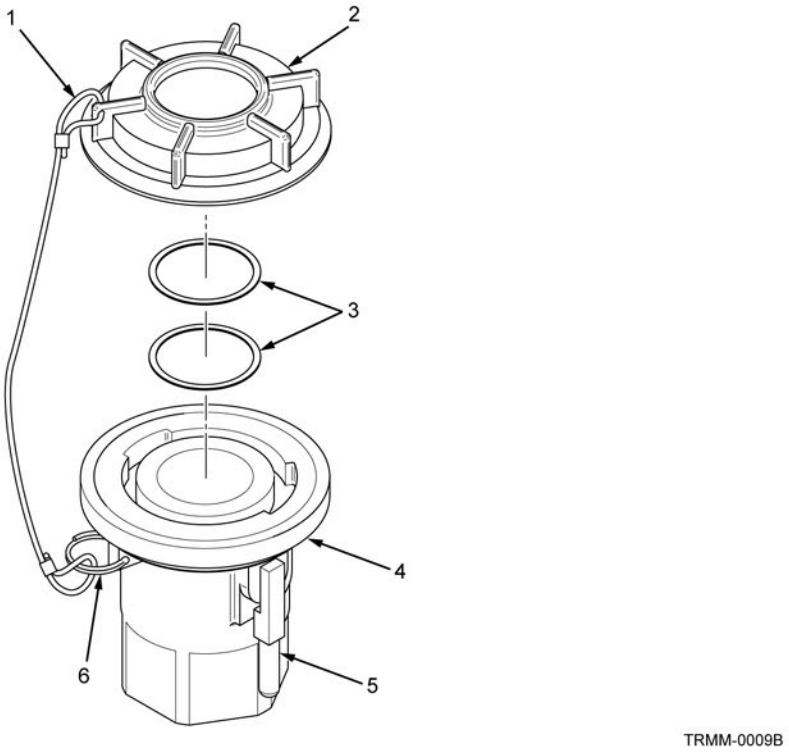


Figure 1. Disassembling Port D (V7) or Port E (V8) Dry Break Coupling.

5. Remove bumper (Figure 1, Item 4) from port D (V7) or port E (V8) dry break coupling (Figure 1, Item 5). Discard bumper.
6. Remove seal (Figure 1, Item 3) from port D (V7) or port E (V8) dry break coupling (Figure 1, Item 5). Discard seal.

END OF TASK

CLEANING

WARNING

Solvent cleaning compound MIL-PRF-680 Type III is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Keep away from open flames and other sources of ignition. Failure to comply may cause injury to personnel.

1. Clean any residual thread sealant from threads of all components.
2. Clean all metal parts with a cleaning cloth and solvent cleaning compound.

CLEANING - Continued

3. Allow parts to dry thoroughly.

END OF TASK

ASSEMBLY

1. Install new seal (Figure 1, Item 3) in groove of port D (V7) or port E (V8) dry break coupling (Figure 1, Item 5).
2. Install new bumper (Figure 1, Item 4) on port D (V7) or port E (V8) dry break coupling (Figure 1, Item 5) with thin lip seal end facing away from port D (V7) or port E (V8) dry break coupling (Figure 1, Item 5).
3. Install cap (Figure 1, Item 2) lanyard (Figure 1, Item 1), and split ring (Figure 1, Item 6) on port D (V7) or port E (V8) dry break coupling (Figure 1, Item 5).
4. Install new seal (Figure 1, Item 3) on dust cap (Figure 1, Item 2).
5. Install dust cap (Figure 1, Item 2) on port D (V7) or port E (V8) dry break coupling (Figure 1, Item 5).

END OF TASK

FOLLOW-ON MAINTENANCE

Install port D (V7) or port E (V8) dry break coupling (WP 0095).

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
VALVED DRYBREAK PORT D/E CONTROL VALVES (V7/V8) REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposable nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)
- Pan, drip (WP 0217, Table 1, Item 8)
- Wrench, internal pipe (WP 0217, Table 1, Item 18)
- Wrench, adjustable, automotive (WP 0217, Table 1, Item 17)

Materials/Parts
- Absorbent material (WP 0216, Table 1, Item 1)
- Cleaning compound, solvent (WP 0216, Table 1, Item 3)
- Cloth, Cleaning (WP 0216, Table 1, Item 4)
- Thread sealing compound (WP 0216, Table 1, Item 15)
- Drybreak coupling (WP 0183, Figure 37, Item 10)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer

References
- ATP 4-43
- TM 10-4930-371-10

Equipment Condition
- MFS TRM grounded (TM 10-4930-371-10)
- MFS TRM shut down (TM 10-4930-371-10)
- MFS TRM piping evacuated (TM 10-4930-371-10)

Time to Complete
- 0.5 Hour(s)

REMOVAL

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Failure to comply could result in injury or death to personnel.

REMOVAL - Continued

NOTE

The procedures for replacing Port D control valve (V8) and Port E control valve (V7) are identical.

1. Remove vapor recovery line dust cap (Figure 1, Item 2).
2. Momentarily open then close bottom loading valve (V1) (Figure 1, Item 1) to vent tank pressure.

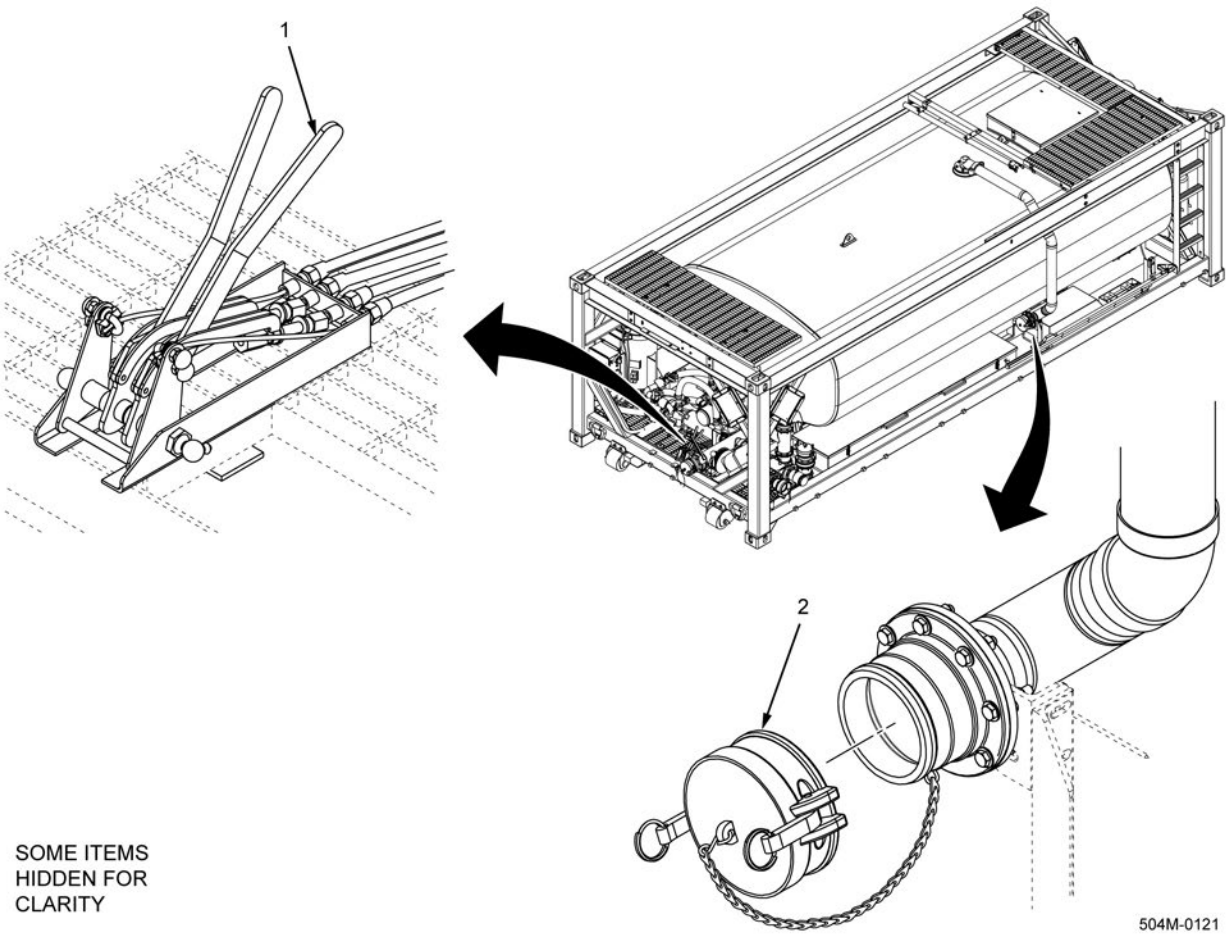


Figure 1. Fuel System Venting.

3. Place drip pan under dry break port coupling (Figure 2, Item 2) to catch residual fuel.
4. Open dry break port coupling (Figure 2, Item 2) to drain residual fuel.
5. Remove dry break port coupling (Figure 2, Item 2) from nipple (Figure 2, Item 1).
6. If removed with dry break port coupling (Figure 2, Item 2), remove nipple (Figure 2, Item 1) and retain for installation.

REMOVAL - Continued

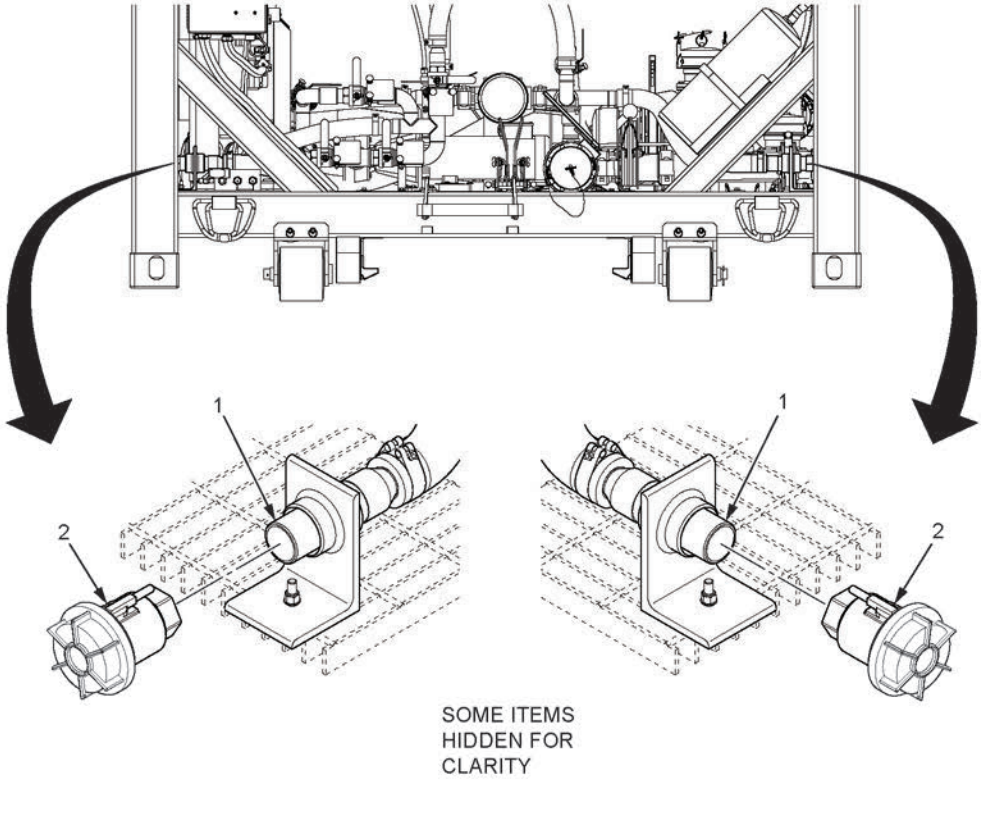


Figure 2. Replacing Valved Drybreak Port D/E Control Valve (V7/V8).

7. Remove drip pan and dispose of fuel IAW unit SOP.

END OF TASK

CLEANING

WARNING

Solvent cleaning compound MIL-PRF-680 Type III is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Keep away from open flames and other sources of ignition. Failure to comply may cause injury to personnel.

1. Remove all buildup of dirt, oil, and debris from threads of nipple (Figure 2, Item 1).
2. Clean all metal parts with a cleaning cloth and solvent cleaning compound.

CLEANING - Continued

3. Allow all parts to dry thoroughly.

END OF TASK

INSTALLATION

WARNING

Thread sealing compound is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Failure to comply may cause injury to personnel.

1. Apply thread sealing compound to threads of nipple (Figure 2, Item 1).
2. If nipple was removed, reinstall on MFS TRM.
3. Install and tighten dry break port coupling (Figure 2, Item 2) onto nipple (Figure 2, Item 1).
4. Install vapor recovery line dust cap (Figure 3, Item 1).

INSTALLATION - Continued

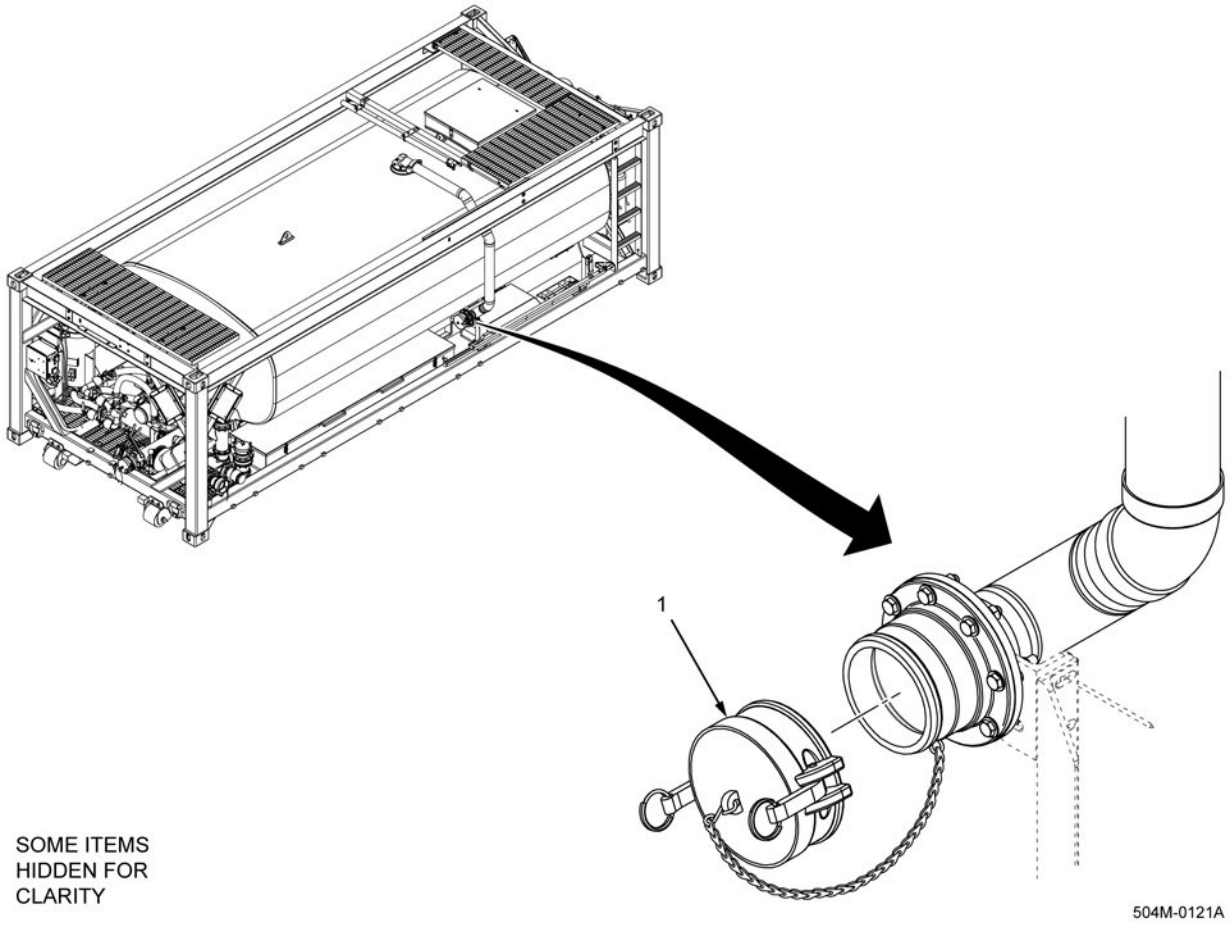


Figure 3. Installing Vapor Recovery Line Dust Cap.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Set up MFS TRM (TM 10-4930-371-10).
2. Check MFS TRM for leaks by recirculating fuel (TM 10-4930-371-10).

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
RIGHT SIDE PIPING ASSEMBLY REPAIR

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposable nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)
- Pan, drip (WP 0217, Table 1, Item 8)

Materials/Parts
- Absorbent material (WP 0216, Table 1, Item 1)
- Cable tie (WP 0216, Table 1, Item 14)
- Cleaning compound, solvent (WP 0216, Table 1, Item 3)
- Cloth, cleaning (WP 0216, Table 1, Item 4)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer (2)

References
- ATP 4-43

References (cont.)
- TM 10-4930-371-10
- WP 0078
- WP 0090
- WP 0092
- WP 0108

Equipment Condition
- MFS TRM grounded (TM 10-4930-371-10)
- MFS TRM shut down (TM 10-4930-371-10)
- MFS TRM drained (TM 10-4930-371-10)
- Discharge Port B Control Valve (V4) removed (WP 0090)
- Discharge Port A Control Valve (V5) removed (WP 0092)
- Precheck valve (V16) removed (WP 0078)
- Vacuum breaker (VB1) removed (WP 0108)

Time to Complete
- 5 Hour(s)

REMOVAL

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Failure to comply could result in injury or death to personnel.

REMOVAL - Continued

1. Remove vapor recovery line dust cap (Figure 1, Item 2).
2. Momentarily open then close bottom loading valve (V1) (Figure 1, Item 1) to vent tank pressure.

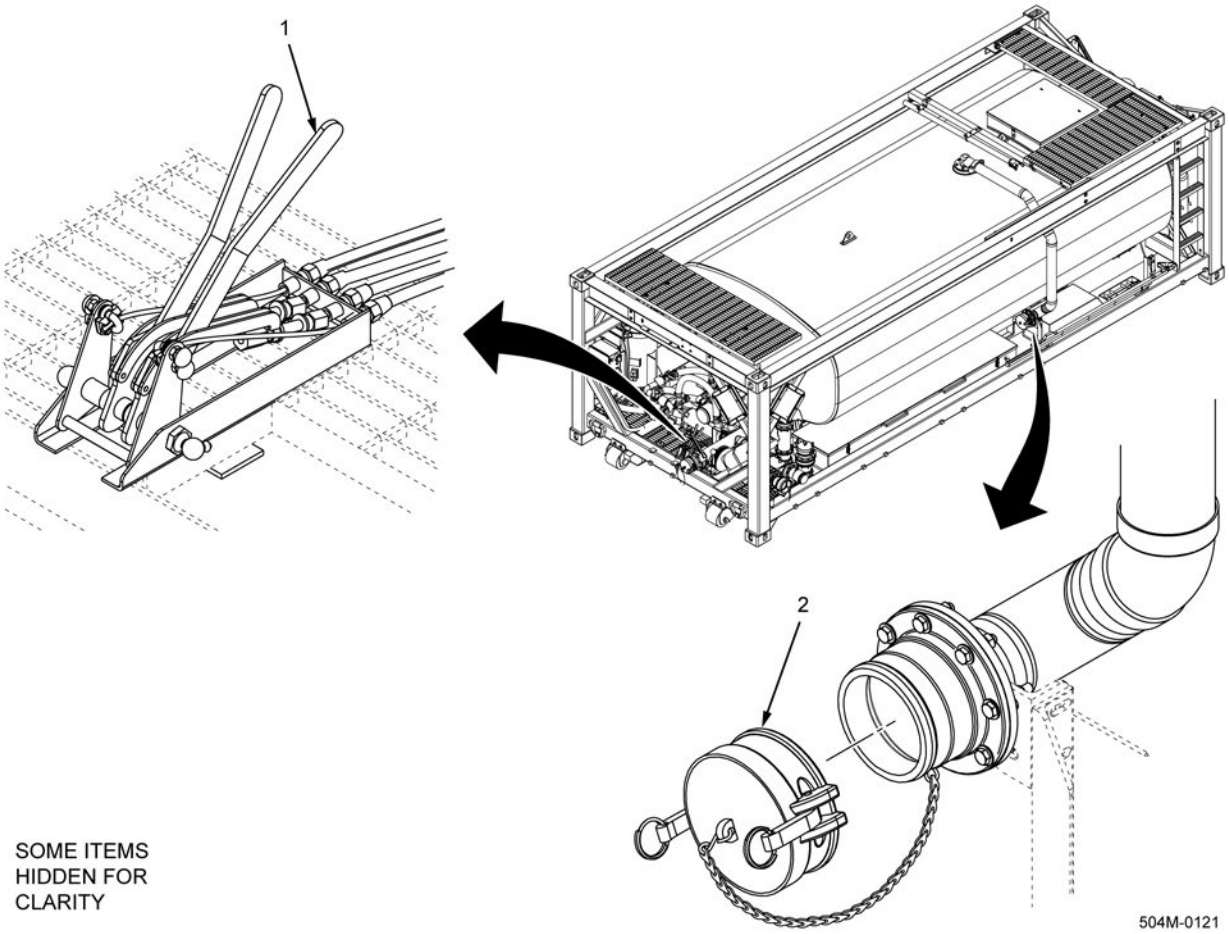


Figure 1. Fuel System Venting.

3. Place drip pan under MFS TRM to catch residual fuel.
4. Remove two nuts (Figure 2, Item 2), bolts (Figure 2, Item 4) and remove coupling halves (Figure 2, Item 3) and detach right side piping manifold assembly (Figure 2, Item 6) from main pipe (Figure 2, Item 1).
5. Remove and discard coupling gasket (Figure 2, Item 5).
6. Dispose of fuel IAW unit SOP.

REMOVAL - Continued

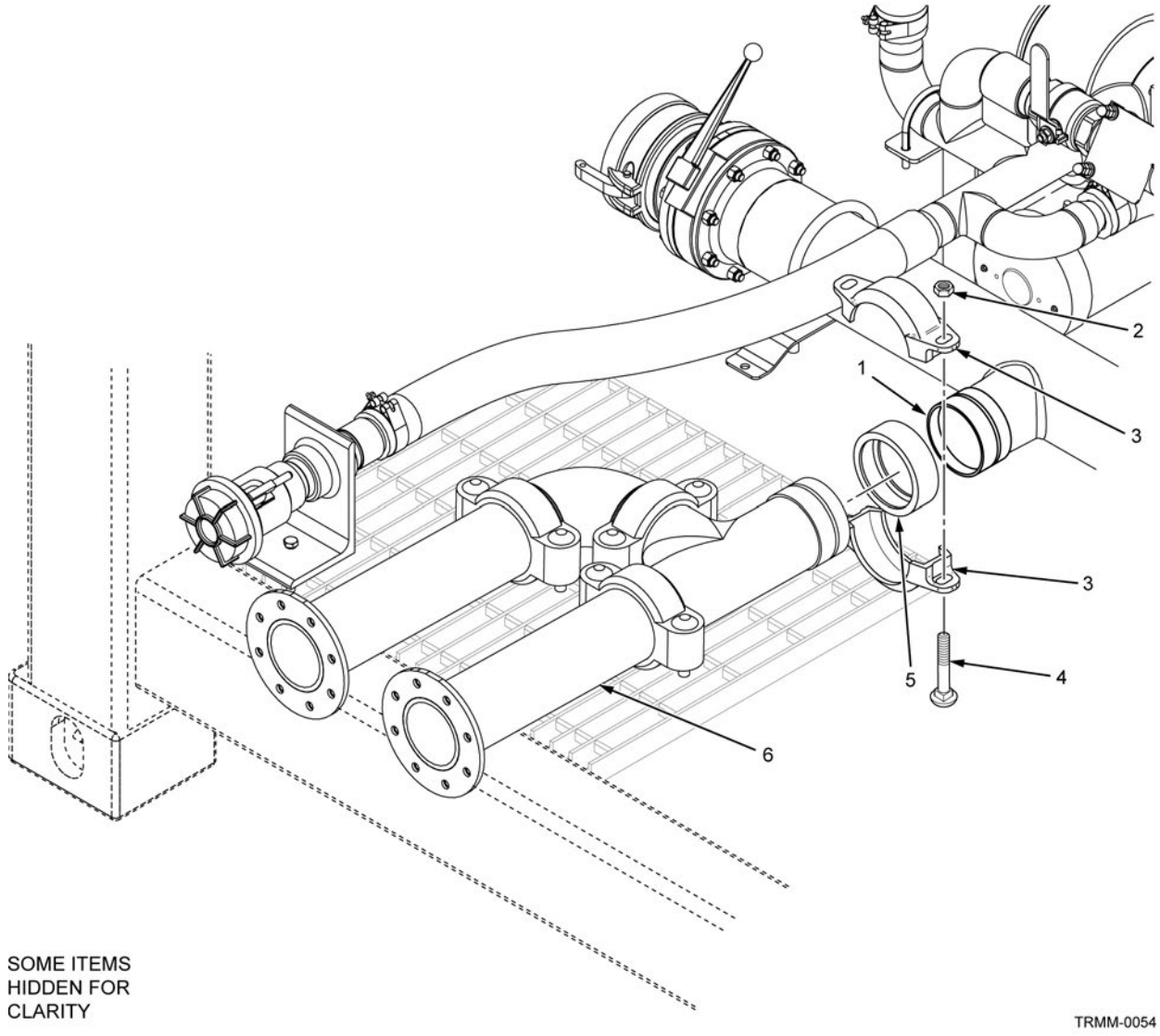


Figure 2. Removing Right Side Piping Assembly.

END OF TASK

DISASSEMBLY

NOTE

- Remove right side piping manifold assembly components only to the extent necessary to replace defective components.
- Note orientation of hardware and components to aid in installation.

DISASSEMBLY - Continued

1. Remove two nuts (Figure 3, Item 4), bolts (Figure 3, Item 7) and remove coupling halves (Figure 3, Item 3) and coupling gasket (Figure 3, Item 2) and remove flanged pipe (Figure 3, Item 1). Discard coupling gasket.
2. Remove two nuts (Figure 3, Item 4), bolts (Figure 3, Item 7) and remove coupling halves (Figure 3, Item 3) and coupling gasket (Figure 3, Item 2) and remove flanged pipe (Figure 3, Item 8). Discard coupling gasket.
3. Remove two nuts (Figure 3, Item 5), bolts (Figure 3, Item 7) and remove coupling halves (Figure 3, Item 3) and coupling gasket (Figure 3, Item 2) and remove elbow (Figure 3, Item 5) and tee (Figure 3, Item 6). Discard coupling gasket.
4. Dispose of fuel IAW unit SOP.

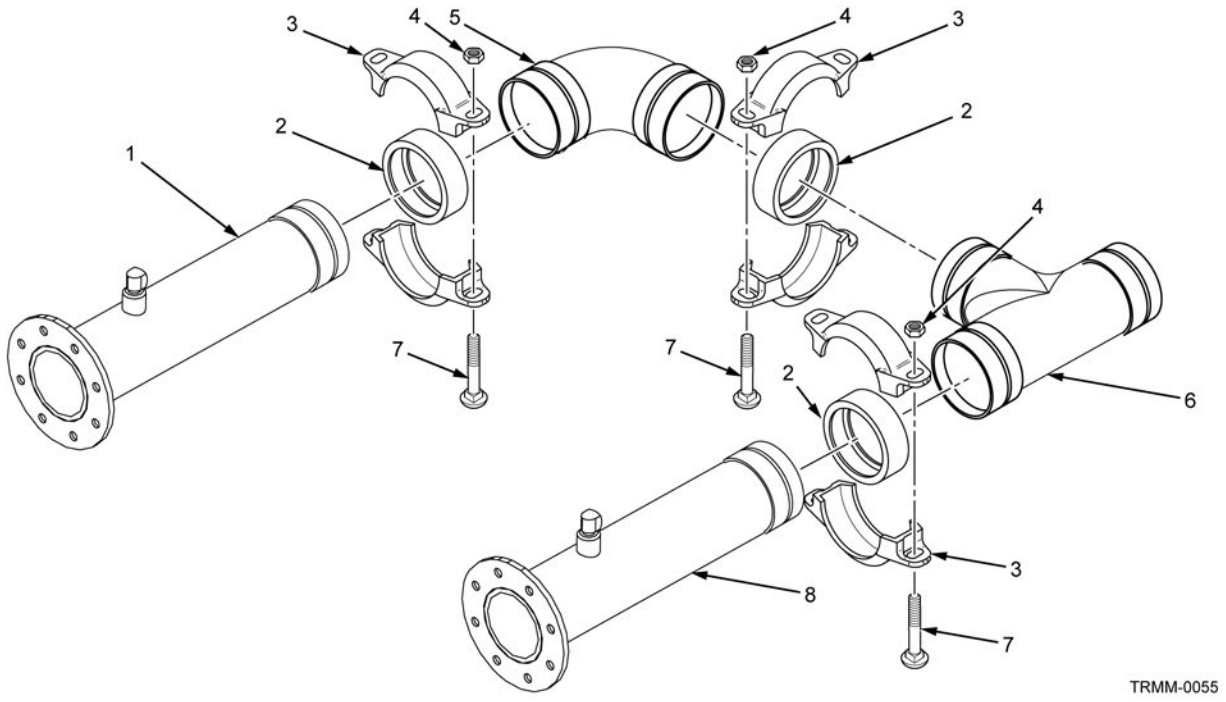


Figure 3. Disassembling Right Side Piping Assembly.

END OF TASK

CLEANING

WARNING

Solvent cleaning compound MIL-PRF-680 Type III is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Keep away from open flames and other sources of ignition. Failure to comply may cause injury to personnel.

1. Clean all metal parts with a cleaning cloth and solvent cleaning compound.

CLEANING - Continued

2. Allow parts to dry thoroughly.

END OF TASK

ASSEMBLY

1. Lightly lubricate new coupling gasket (Figure 4, Item 2) with fuel and install on flanged pipe (Figure 4, Item 8).
2. Install coupling halves (Figure 4, Item 3) to flanged pipe (Figure 4, Item 8) to tee (Figure 4, Item 6) and secure with two bolts (Figure 4, Item 7) and nuts (Figure 4, Item 5).
3. Lightly lubricate new coupling gasket (Figure 4, Item 2) with fuel and install on flanged pipe (Figure 4, Item 1).
4. Install coupling halves (Figure 4, Item 3) to connect flanged pipe (Figure 4, Item 1) to elbow (Figure 4, Item 4) and secure with two bolts (Figure 4, Item 7) and nuts (Figure 4, Item 5).
5. Lightly lubricate new coupling gasket (Figure 4, Item 2) with fuel and install on elbow (Figure 4, Item 4).
6. Install coupling halves (Figure 4, Item 3) to connect elbow (Figure 4, Item 4) to tee (Figure 4, Item 6) and secure with two bolts (Figure 4, Item 7) and nuts (Figure 4, Item 5).

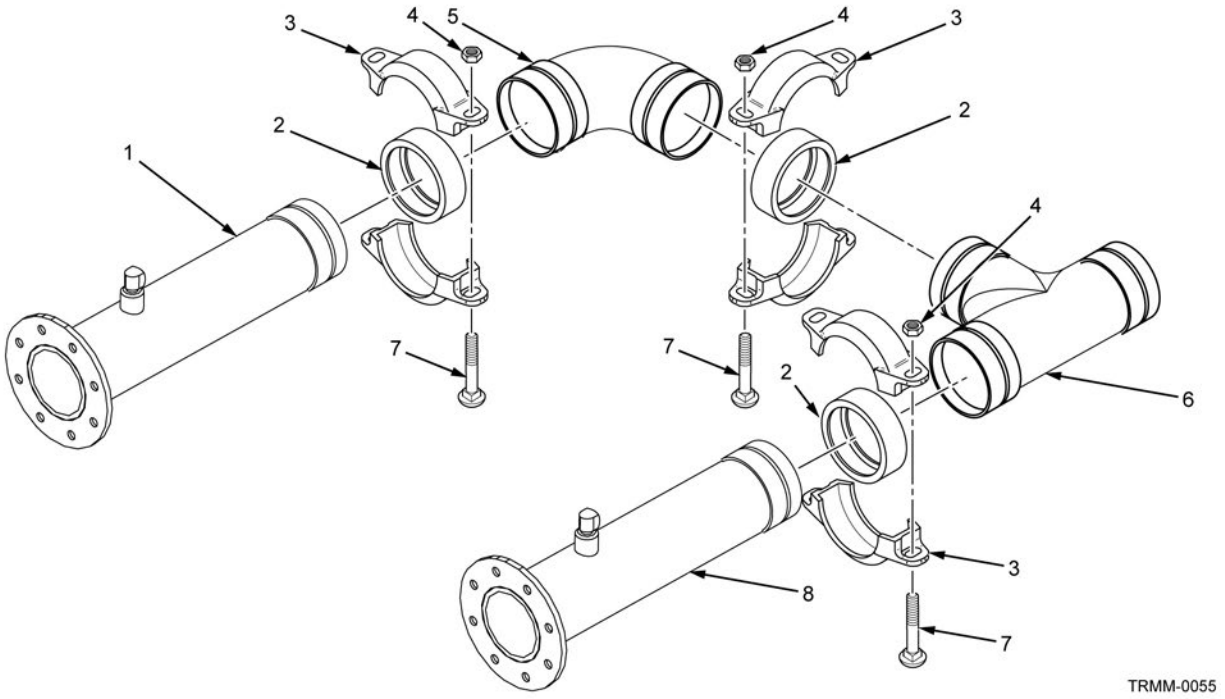


Figure 4. Assembling Right Side Piping Assembly.

END OF TASK

INSTALLATION

1. Lightly lubricate new coupling gasket (Figure 5, Item 5) with fuel and install on main pipe (Figure 5, Item 1).
2. Install coupling halves (Figure 5, Item 3) to connect right side piping manifold assembly (Figure 5, Item 6) to main pipe (Figure 5, Item 1) and secure with two bolts (Figure 5, Item 4) and nuts (Figure 5, Item 2).
3. Install cable tie as noted during removal.

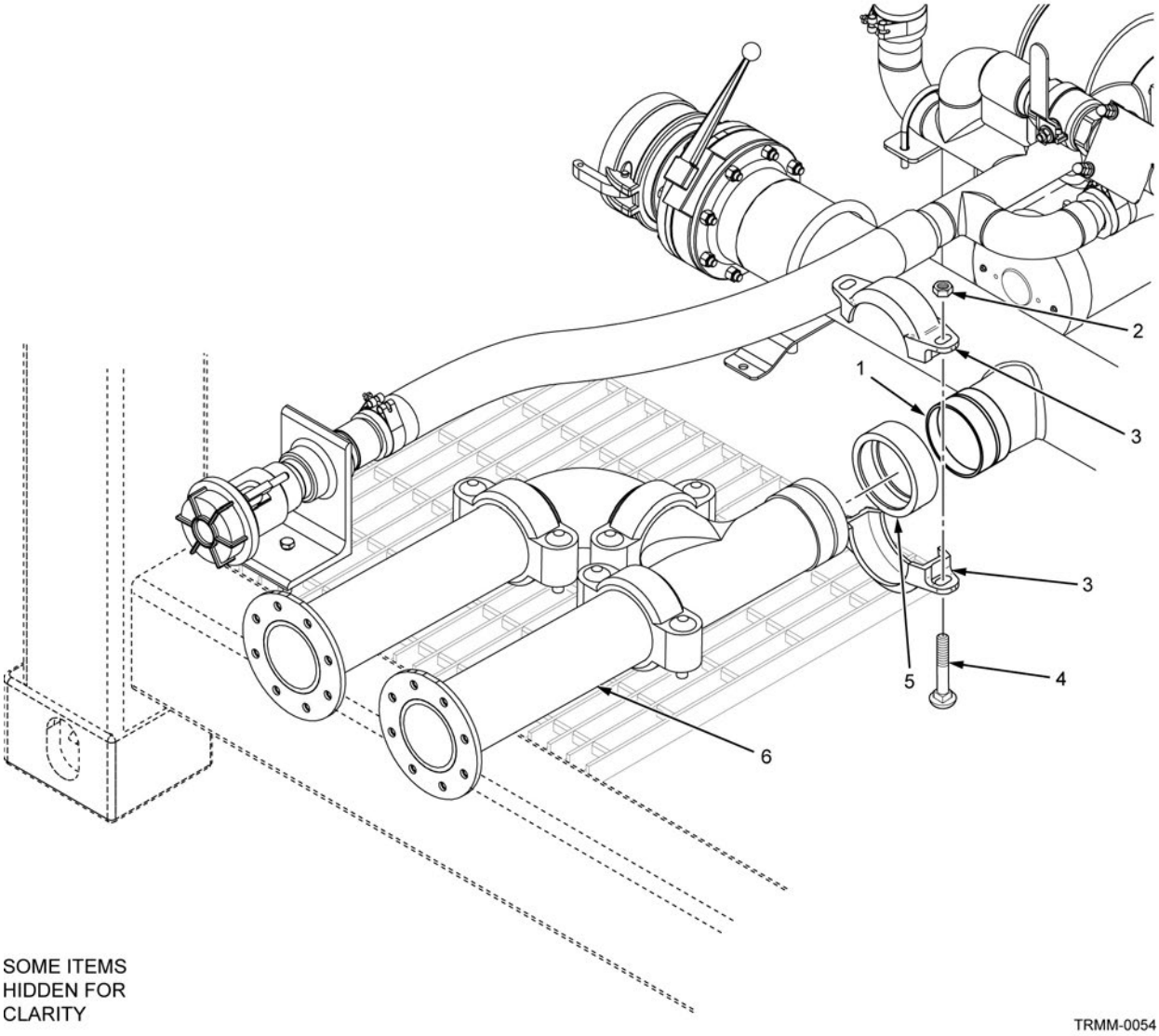


Figure 5. Replacing Right Side Piping Assembly.

4. Install vapor recovery line dust cap (Figure 6, Item 1).

INSTALLATION - Continued

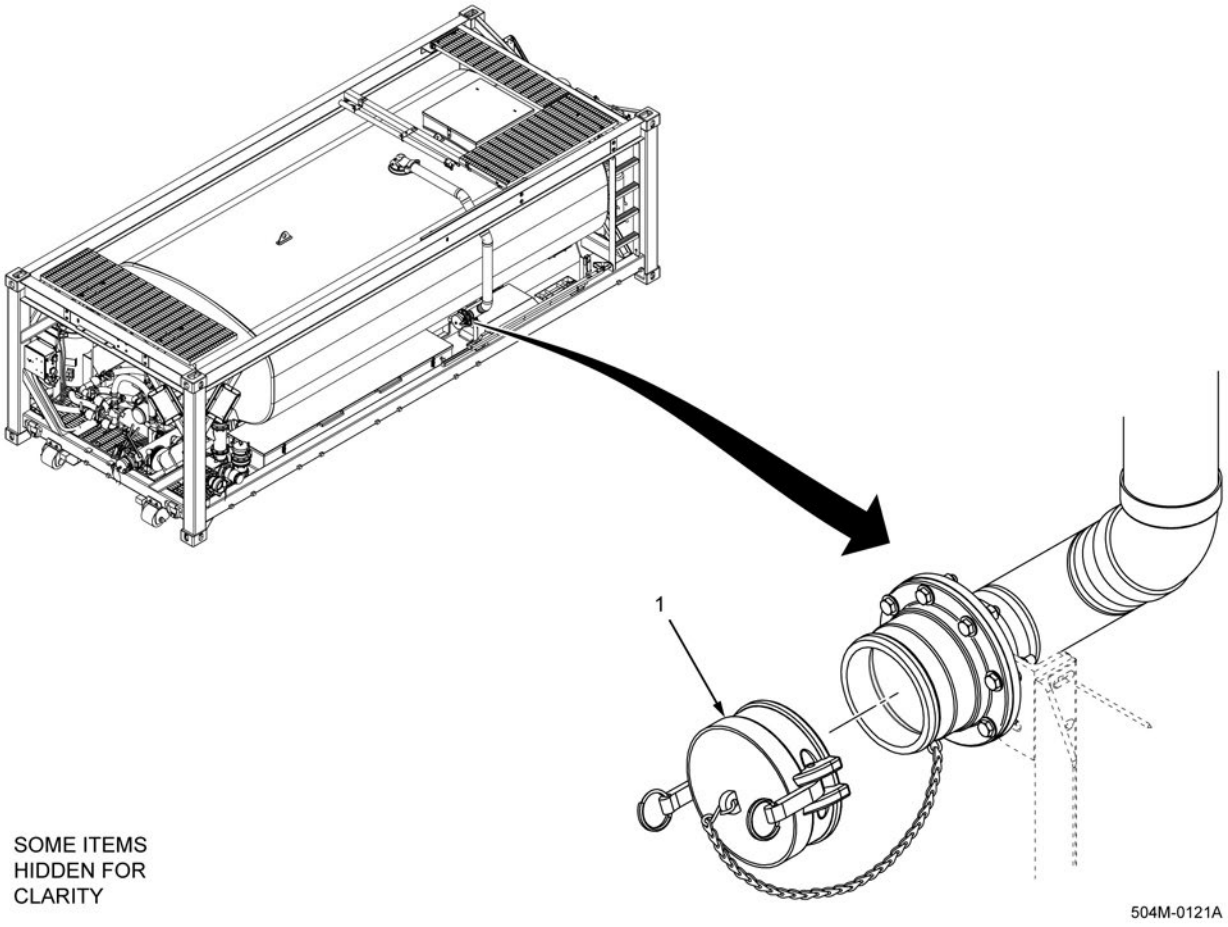


Figure 6. Installing Vapor Recovery Line Dust Cap.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install discharge Port B Control Valve (V4) (WP 0090).
2. Install discharge Port A Control Valve (V5) (WP 0092).
3. Install precheck valve (V16) (WP 0078).
4. Install vacuum breaker (VB1) (WP 0108).
5. Set up MFS TRM (TM 10-4930-371-10).
6. Check MFS TRM for leaks by recirculating fuel (TM 10-4930-371-10).

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
BOTTOM PIPING ASSEMBLY, ELBOW REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposable nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)
- Pan, drip (WP 0217, Table 1, Item 8)

Materials/Parts
- Absorbent material (WP 0216, Table 1, Item 1)
- Cleaning compound, solvent (WP 0216, Table 1, Item 3)
- Cloth, cleaning (WP 0216, Table 1, Item 4)
- Gasket Qty: 2 (WP 0185, Figure 39, Item 3)
- Gasket (WP 0185, Figure 39, Item 7)
- Elbow (WP 0185, Figure 39, Item 4)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer (2)

References
- ATP 4-43
- TM 10-4930-371-10

Equipment Condition
- MFS TRM grounded (TM 10-4930-371-10)
- MFS TRM drained (TM 10-4930-371-10)
- MFS TRM loaded on PLS trailer (TM 10-4930-371-10)

Time to Complete
- 1.5 Hour(s)

REMOVAL

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Failure to comply could result in injury or death to personnel.

1. Remove vapor recovery line dust cap (Figure 1, Item 2).
2. Momentarily open then close bottom loading valve (V1) (Figure 1, Item 1) to vent tank pressure.

REMOVAL - Continued

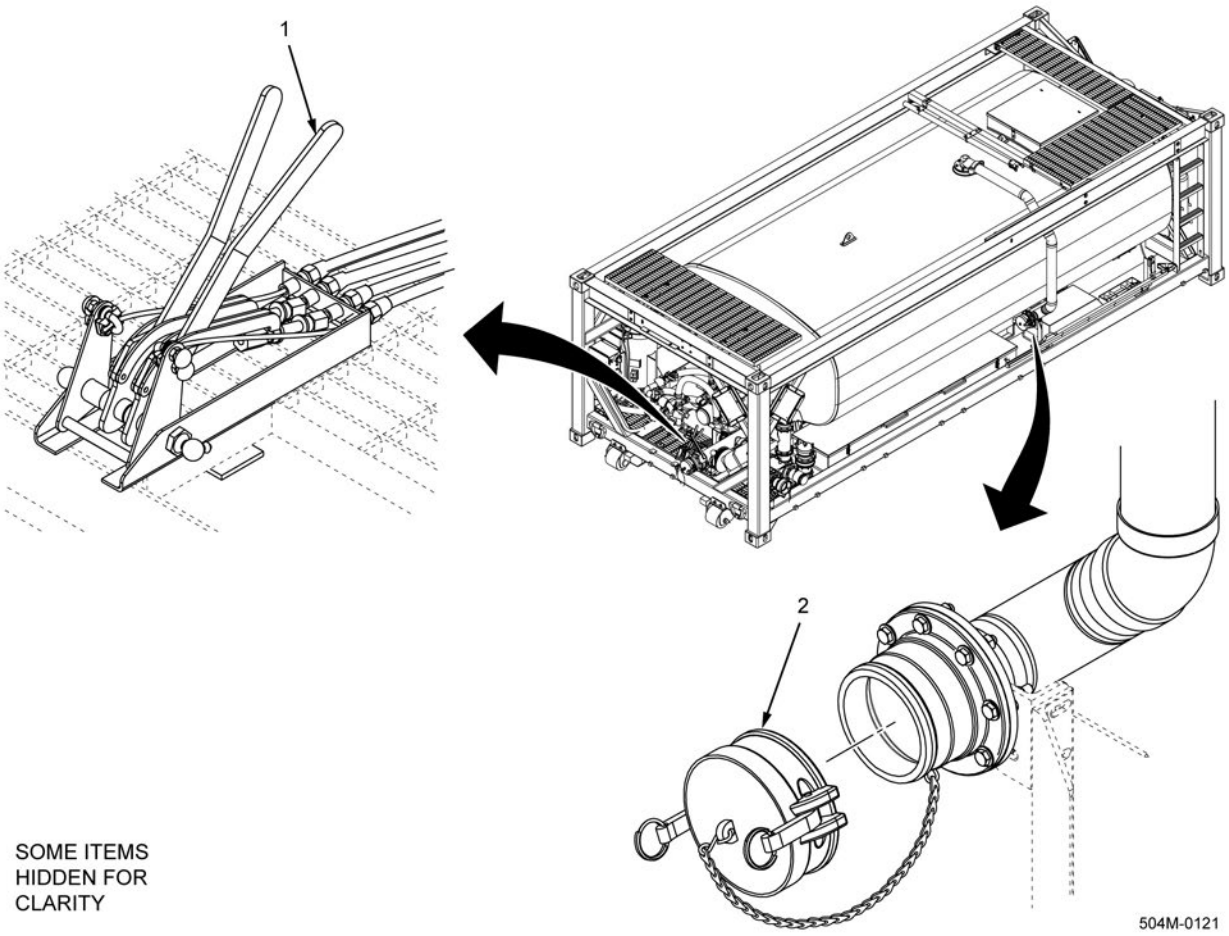


Figure 1. Fuel System Venting.

3. Place drip pan as close as possible to elbow (Figure 2, Item 5) to catch residual fuel.

NOTE

Note orientation of hardware and components to aid in installation.

4. Remove two bolts (Figure 2, Item 2), nuts (Figure 2, Item 6), and coupling halves (Figure 2, Item 3) from bottom tee piping assembly (Figure 2, Item 1) and elbow (Figure 2, Item 5).
5. Slide gasket (Figure 2, Item 4) onto elbow (Figure 2, Item 5).
6. Remove two bolts (Figure 2, Item 12), nuts (Figure 2, Item 9), and coupling halves (Figure 2, Item 8) from bottom loading valve (V1) (Figure 2, Item 10) and reducer (Figure 2, Item 7).
7. Remove and discard gasket (Figure 2, Item 11).
8. Remove two bolts (Figure 2, Item 2), nuts (Figure 2, Item 6), and coupling halves (Figure 2, Item 3) from reducer (Figure 2, Item 7) and elbow (Figure 2, Item 5).
9. Remove and discard two gaskets (Figure 2, Item 4).

REMOVAL - Continued

10. Remove drip pan and dispose of fuel IAW unit SOP.

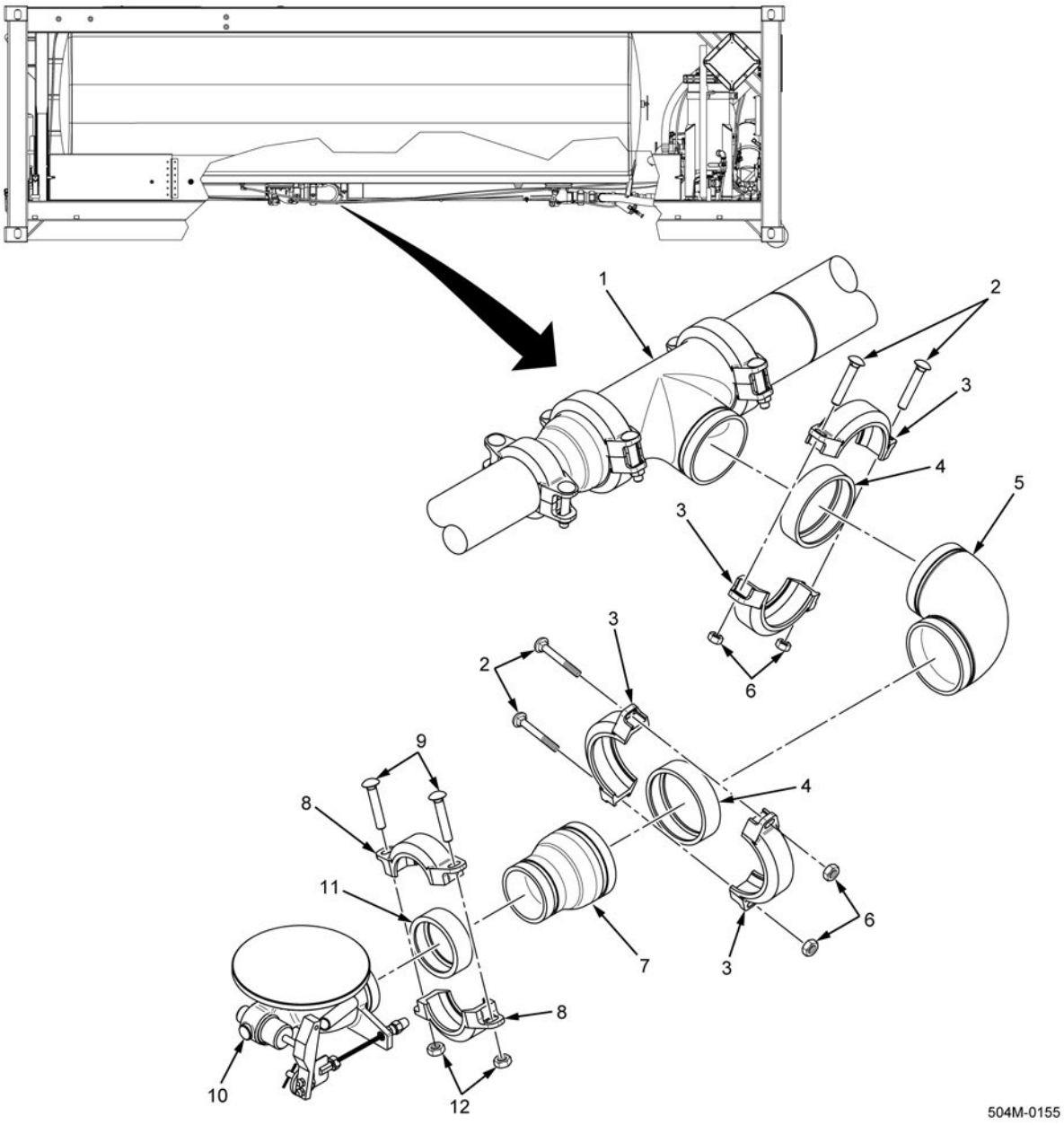


Figure 2. Bottom Elbow Piping Assembly.

END OF TASK

CLEANING

WARNING

Solvent cleaning compound MIL-PRF-680 Type III is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Keep away from open flames and other sources of ignition. Failure to comply may cause injury to personnel.

1. Remove all dirt, oil, and debris from all mating surfaces and clamping areas.
2. Clean all metal parts with a cleaning cloth and solvent cleaning compound.
3. Allow parts to dry thoroughly.

END OF TASK

INSTALLATION

1. Lubricate new gasket (Figure 2, Item 4) with fuel and install on reducer (Figure 2, Item 7).
2. Slide gasket (Figure 2, Item 4) onto elbow (Figure 2, Item 5) so that half of the gasket (Figure 2, Item 4) remains on the reducer (Figure 2, Item 7).
3. Install coupling halves (Figure 2, Item 3) on reducer (Figure 2, Item 7) and elbow (Figure 2, Item 5) and secure with two bolts (Figure 2, Item 2) and nuts (Figure 2, Item 6). Ensure coupling halves are touching.
4. Lubricate new gasket (Figure 2, Item 11) with fuel and install on reducer (Figure 2, Item 7).
5. Lubricate new gasket (Figure 2, Item 4) with fuel and install on elbow (Figure 2, Item 5).
6. While supporting elbow (Figure 2, Item 5), slide gasket (Figure 2, Item 11) onto bottom loading valve (V1) (Figure 2, Item 10) so that half of the gasket (Figure 2, Item 11) remains on the reducer (Figure 2, Item 7).
7. Install coupling halves (Figure 2, Item 8) on reducer (Figure 2, Item 7) and bottom loading valve (V1) (Figure 2, Item 10) and secure with two bolts (Figure 2, Item 12) and nuts (Figure 2, Item 9). Ensure coupling halves are touching.
8. Slide gasket (Figure 2, Item 4) onto bottom tee piping (Figure 2, Item 1) so that half of the gasket (Figure 2, Item 4) remains on the bottom elbow piping (Figure 2, Item 5).
9. Install coupling halves (Figure 2, Item 3) on elbow (Figure 2, Item 5) and bottom tee piping (Figure 2, Item 1) and secure with two bolts (Figure 2, Item 2) and nuts (Figure 2, Item 6). Ensure coupling halves are touching.
10. Install vapor recovery line dust cap (Figure 3, Item 1).

INSTALLATION - Continued

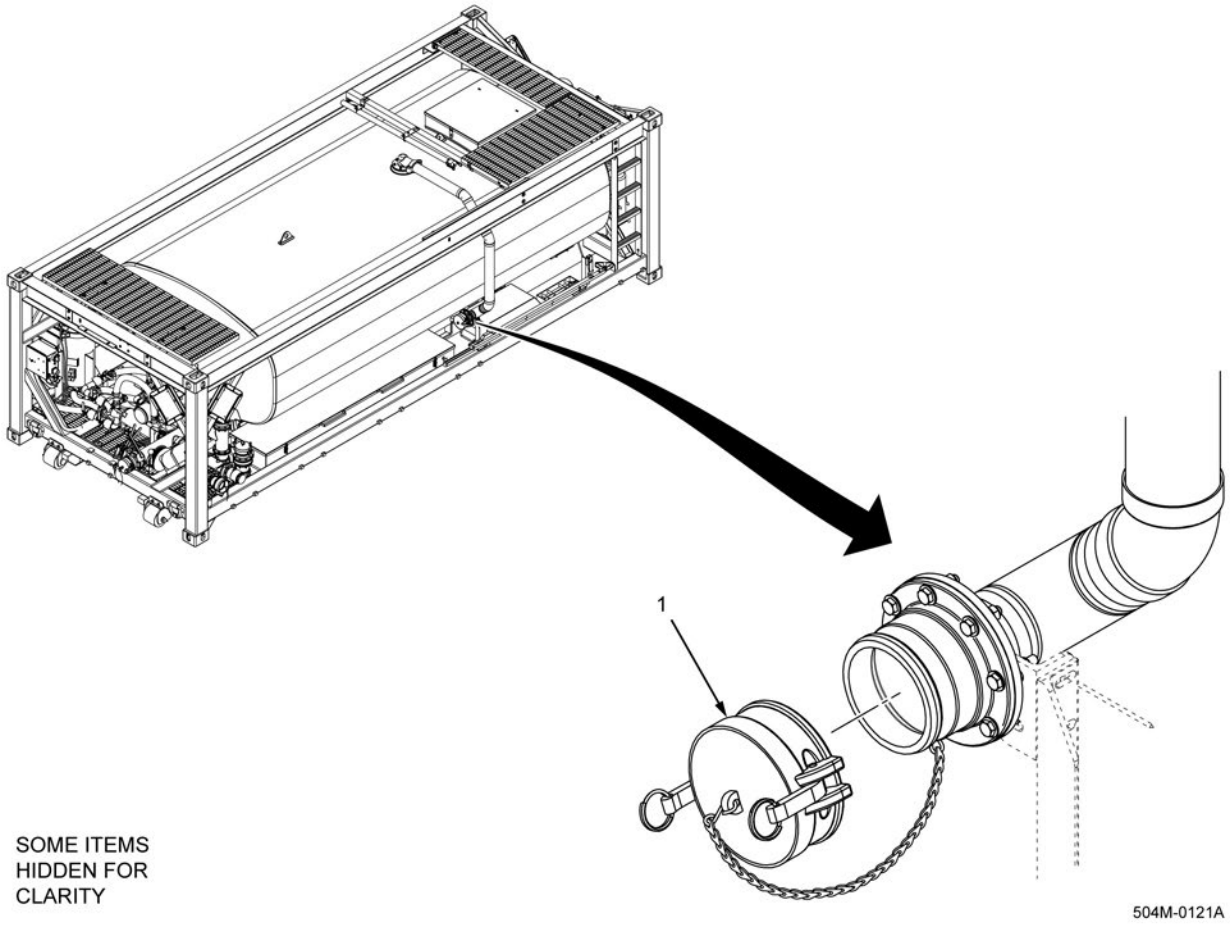


Figure 3. Installing Vapor Recovery Line Dust Cap.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Set up MFS TRM (TM 10-4930-371-10).
2. Check MFS TRM for leaks by recirculating fuel (TM 10-4930-371-10).

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
BOTTOM PIPING ASSEMBLY, FRONT PIPING REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposable nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)
- Pan, drip (WP 0217, Table 1, Item 8)

Materials/Parts
- Absorbent material (WP 0216, Table 1, Item 1)
- Cleaning compound, solvent (WP 0216, Table 1, Item 3)
- Cloth, cleaning (WP 0216, Table 1, Item 4)
- Gasket (WP 0186, Figure 40, Item 3)
- Nut, Self-Locking, Hexagon (LOCKNUTS) Qty: 2 (WP 0186, Figure 40, Item 5)
- Pipe (WP 0186, Figure 40, Item 4)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer (2)

References
- ATP 4-43

References (cont.)
- TM 10-4930-371-10
- WP 0091

Equipment Condition
- MFS TRM grounded (TM 10-4930-371-10)
- MFS TRM drained (TM 10-4930-371-10)
- MFS TRM loaded on PLS trailer (TM 10-4930-371-10)
- MFS TRM shut down (TM 10-4930-371-10)
- Discharge Port G Removed (WP 0091)

Time to Complete
- 1.5 Hour(s)

REMOVAL

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Failure to comply could result in injury or death to personnel.

1. Place drip pan as close as possible to bottom elbow piping assembly (Figure 1, Item 3) to catch residual fuel.

NOTE

Note orientation of piping assembly and mounting hardware to aid in installation.

2. Remove two clamps (Figure 1, Item 6) from front bottom piping assembly (Figure 1, Item 7).
3. Remove two bolts (Figure 1, Item 2), nuts (Figure 1, Item 5), and coupling halves (Figure 1, Item 1) from front bottom piping assembly (Figure 1, Item 7) and bottom tee assembly (Figure 1, Item 3).
4. Remove two locknuts (Figure 1, Item 9), and flat washers (Figure 1, Item 10), and remove U-bolt (Figure 1, Item 11) from frame bracket (Figure 1, Item 8). Discard locknuts.
5. Remove front bottom piping assembly (Figure 1, Item 7) from MFS TRM.
6. Remove and discard gasket (Figure 1, Item 4).

REMOVAL - Continued

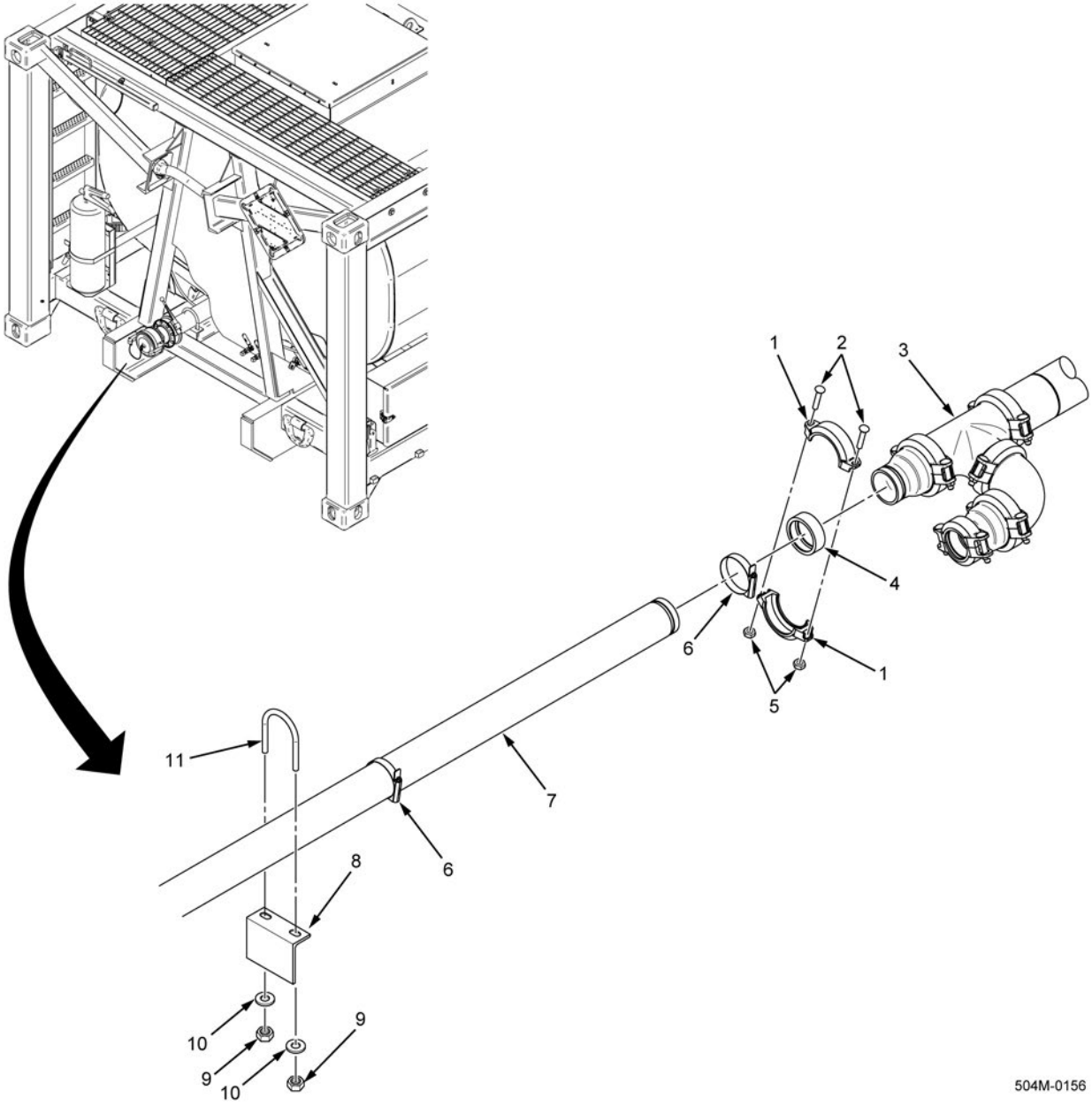


Figure 1. Front Bottom Piping Assembly.

END OF TASK

CLEANING

WARNING

Solvent cleaning compound MIL-PRF-680 Type III is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Keep away from open flames and other sources of ignition. Failure to comply may cause injury to personnel.

1. Remove all dirt, oil, and debris from all mating surfaces and clamping areas.
2. Clean all metal parts with a cleaning cloth and solvent cleaning compound.
3. Allow parts to dry thoroughly.

END OF TASK

INSTALLATION

1. Lubricate new gasket (Figure 1, Item 4) with fuel and install on front bottom piping assembly (Figure 1, Item 7).
2. Install front bottom piping assembly (Figure 1, Item 7) on bottom tee assembly (Figure 1, Item 3).
3. Slide gasket (Figure 1, Item 4) onto bottom tee assembly (Figure 1, Item 3) so that half of the gasket (Figure 1, Item 4) remains on the front bottom piping assembly (Figure 1, Item 7).
4. Install two coupling halves (Figure 1, Item 1) and secure with two bolts (Figure 1, Item 2) and nuts (Figure 1, Item 5). Ensure coupling halves are touching.

CAUTION

Do not overtighten cable clamps. Damage to equipment could occur.

5. Install two hose clamps (Figure 1, Item 6) on front bottom piping assembly (Figure 1, Item 7). Ensure hose clamps (Figure 1, Item 6) secure lines to pipe as noted during removal.
6. Install U-bolt (Figure 1, Item 11) to front bottom piping assembly, through frame bracket (Figure 1, Item 8), and secure with two flat washers (Figure 1, Item 10) and new locknuts (Figure 1, Item 9).

INSTALLATION - Continued

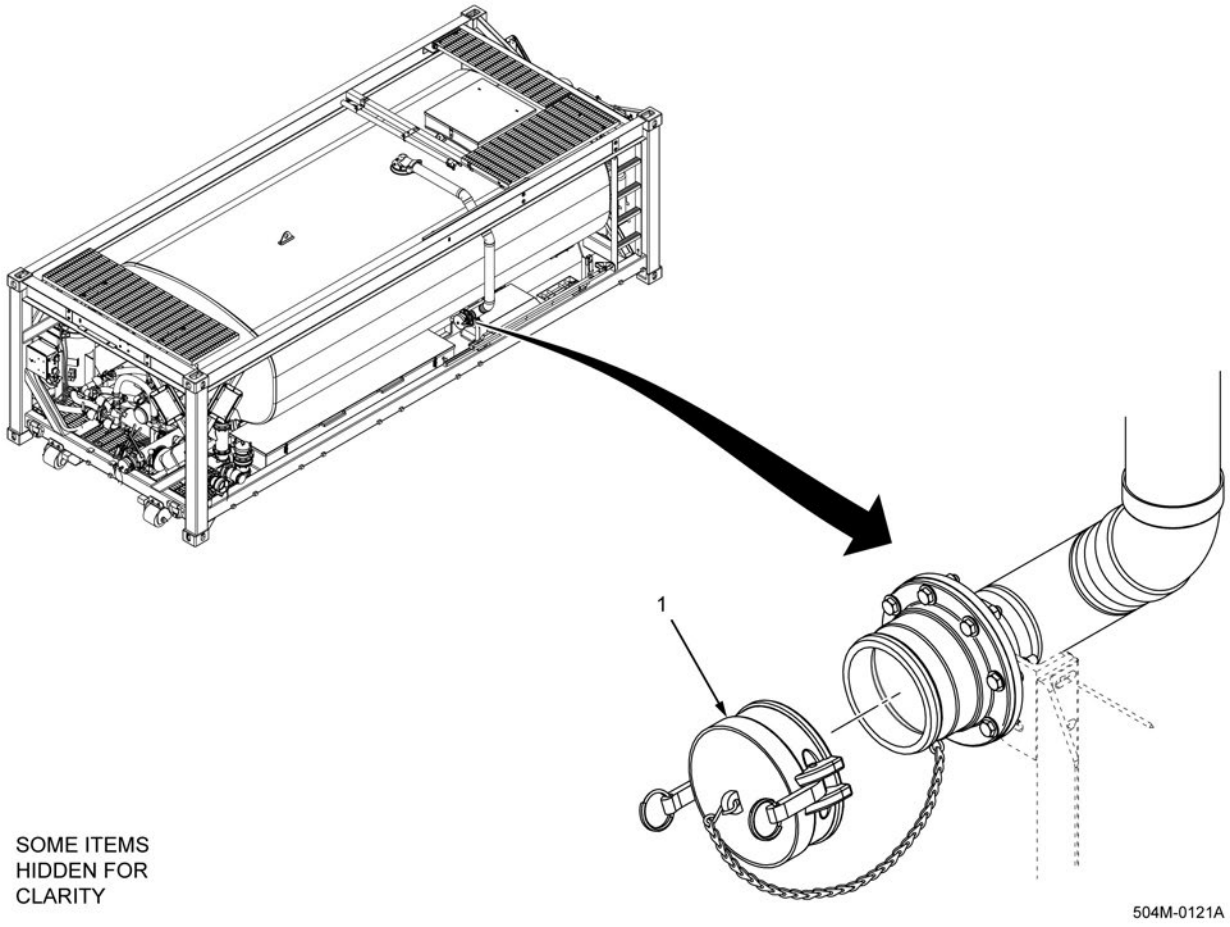


Figure 2. Installing Vapor Recovery Line Dust Cap.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install Port G (WP 0091).
2. Set up MFS TRM (TM 10-4930-371-10).
3. Check MFS TRM for leaks by recirculating fuel (TM 10-4930-371-10).

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
BOTTOM PIPING ASSEMBLY, TEE REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposable nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)
- Pan, drip (WP 0217, Table 1, Item 8)
- Pliers, multiple position (WP 0217, Table 1, Item 9)
- Wrench, pipe, 18 inch (WP 0217, Table 1, Item 19)

Materials/Parts
- Absorbent material (WP 0216, Table 1, Item 1)
- Cleaning compound, solvent (WP 0216, Table 1, Item 3)
- Cloth, cleaning (WP 0216, Table 1, Item 4)
- Gasket (WP 0185, Figure 39, Item 3)
- Gasket (WP 0186, Figure 40, Item 3)
- Gasket (WP 0187, Figure 41, Item 5)

Materials/Parts (cont.)
- Gasket (WP 0188, Figure 42, Item 3)
- Pipe (WP 0187, Figure 41, Item 3)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer (2)

References
- ATP 4-43
- TM 10-4930-371-10

Equipment Condition
- MFS TRM grounded (TM 10-4930-371-10)
- MFS TRM drained (TM 10-4930-371-10)
- MFS TRM loaded on PLS trailer (TM 10-4930-371-10)
- MFS TRM shut down (TM 10-4930-371-10)

Time to Complete
- 1.5 Hour(s)

REMOVAL

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Failure to comply could result in injury or death to personnel.

1. Remove vapor recovery line dust cap (Figure 1, Item 2).

REMOVAL - Continued

2. Momentarily open then close bottom loading valve (V1) (Figure 1, Item 1) to vent tank pressure.

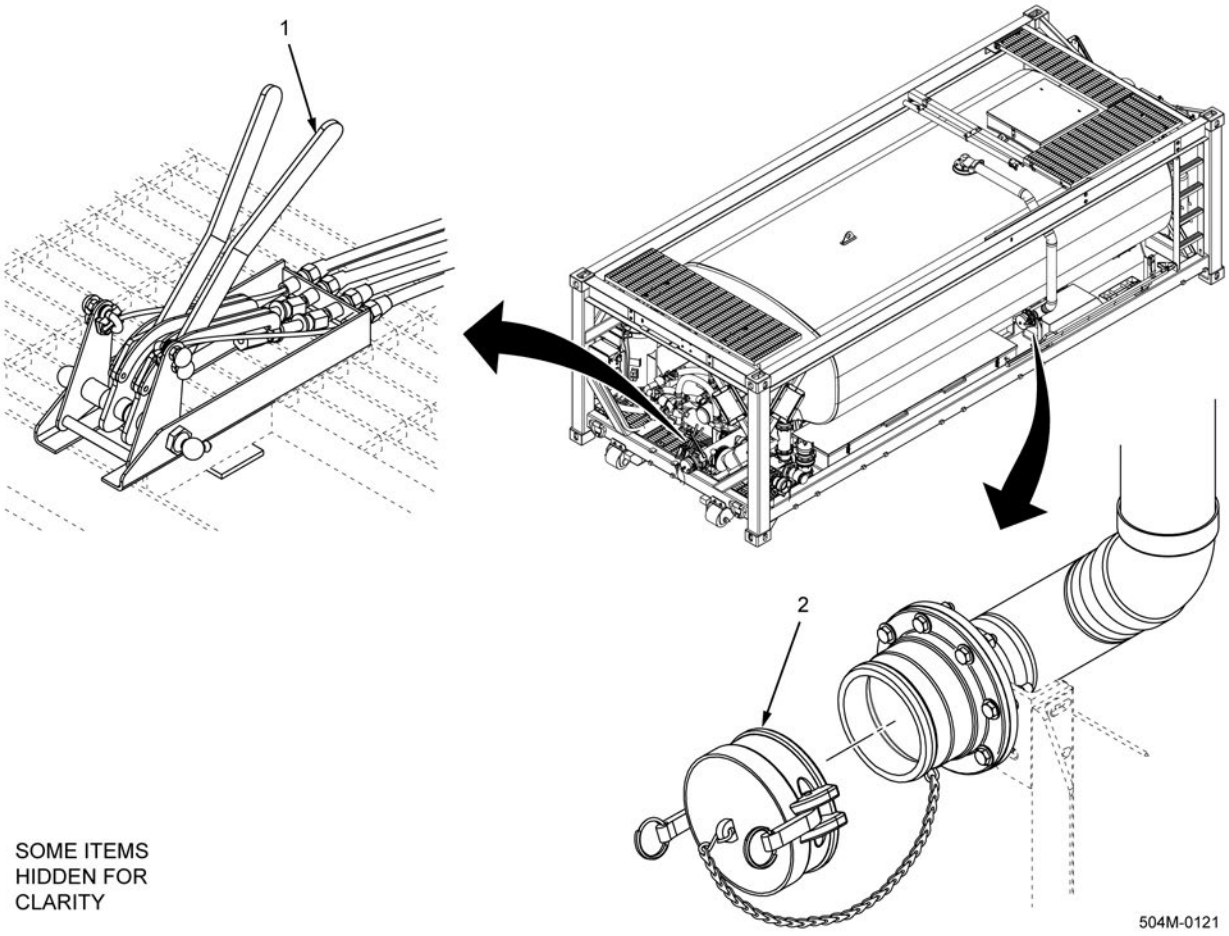


Figure 1. Fuel System Venting.

3. Place drip pan as close as possible to tee (Figure 2, Item 13) to catch residual fuel.

NOTE

Note orientation of bottom tee piping assembly and mounting hardware to aid in installation.

4. Remove two hose clamps (Figure 2, Item 1).
5. Remove two bolts (Figure 2, Item 12), nuts (Figure 2, Item 9), and coupling halves (Figure 2, Item 8) from front bottom piping assembly (Figure 2, Item 10) and reducer (Figure 2, Item 7).
6. Slide gasket (Figure 2, Item 11) onto reducer (Figure 2, Item 7).
7. Remove two bolts (Figure 2, Item 2), nuts (Figure 2, Item 6), and coupling halves (Figure 2, Item 3) from bottom tee piping assembly (Figure 2, Item 13) and rear bottom piping assembly (Figure 2, Item 14).
8. Slide gasket (Figure 2, Item 4) onto bottom tee piping assembly (Figure 2, Item 13).
9. Remove two bolts (Figure 2, Item 2), nuts (Figure 2, Item 6) and coupling halves (Figure 2, Item 3) from bottom tee piping assembly (Figure 2, Item 13) and bottom elbow piping assembly (Figure 2, Item 5).

REMOVAL - Continued

10. Slide gasket (Figure 2, Item 4) onto bottom tee piping assembly (Figure 2, Item 13).
11. Remove bottom tee piping assembly (Figure 2, Item 13) from MFS TRM.
12. Remove two bolts (Figure 2, Item 2), nuts (Figure 2, Item 6), and coupling halves (Figure 2, Item 3) from bottom tee piping assembly (Figure 2, Item 13) and reducer (Figure 2, Item 7).
13. Remove and discard three gaskets (Figure 2, Item 4) from bottom tee piping assembly (Figure 2, Item 13) and one gasket (Figure 2, Item 11) from reducer (Figure 2, Item 7).

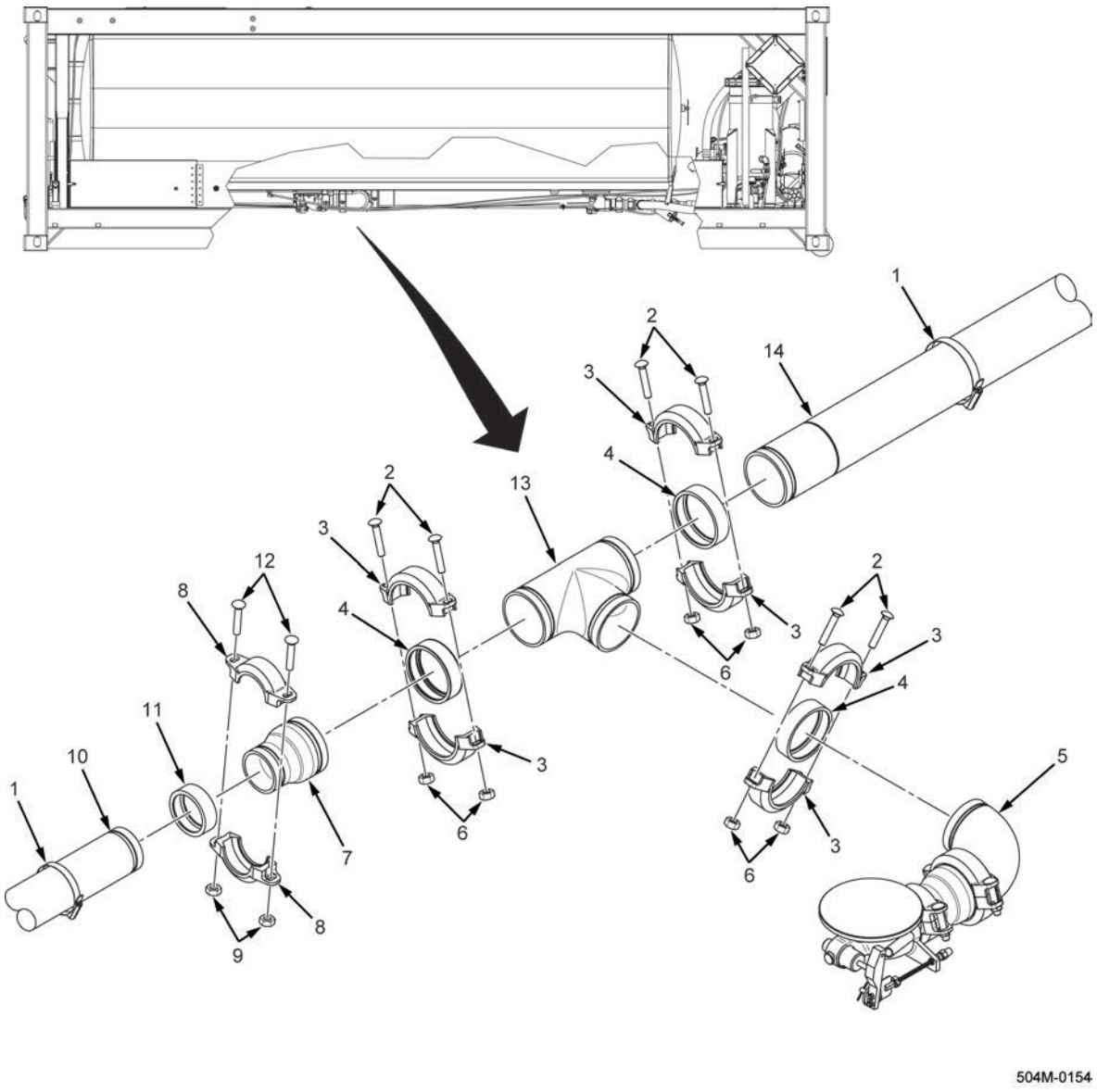


Figure 2. Bottom Tee Piping Assembly.

END OF TASK

CLEANING

WARNING

Solvent cleaning compound MIL-PRF-680 Type III is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Keep away from open flames and other sources of ignition. Failure to comply may cause injury to personnel.

1. Remove all dirt, oil, and debris from all mating surfaces and clamping areas.
2. Clean all metal parts with a cleaning cloth and solvent cleaning compound.
3. Allow parts to dry thoroughly.

END OF TASK

INSTALLATION

1. Lubricate two new gaskets (Figure 2, Item 11 and 4) with fuel.
2. Install two new gaskets (Figure 2, Item 11 and 4) on reducer (Figure 2, Item 7).
3. Lubricate two new gaskets (Figure 2, Item 4) with fuel.
4. Install two new gaskets (Figure 2, Item 4) on tee (Figure 2, Item 13).
5. Install tee (Figure 2, Item 13) on rear bottom piping assembly (Figure 2, Item 14). Slide gasket onto rear bottom piping assembly so that half the gasket remains on the tee (Figure 2, Item 13).
6. Loosely install coupling halves (Figure 2, Item 3) using two bolts (Figure 2, Item 2) and two nuts (Figure 2, Item 6).
7. Slide gasket (Figure 2, Item 4) onto bottom elbow piping assembly (Figure 2, Item 5) so that half the gasket remains on the tee (Figure 2, Item 13).
8. Loosely install coupling halves (Figure 2, Item 3) using two bolts (Figure 2, Item 2) and two nuts (Figure 2, Item 6).
9. Slide gasket (Figure 2, Item 4) onto tee (Figure 2, Item 13) so that half the gasket remains on the reducer (Figure 2, Item 7).
10. Loosely install coupling halves (Figure 2, Item 3) using two bolts (Figure 2, Item 2) and two nuts (Figure 2, Item 6).
11. Slide gasket (Figure 2, Item 11) onto front bottom piping assembly (Figure 2, Item 10) so that half the gasket remains on the reducer (Figure 2, Item 7).
12. Loosely install coupling halves (Figure 2, Item 8) using two bolts (Figure 2, Item 12) and nuts (Figure 2, Item 9).
13. Tighten six nuts (Figure 2, Item 6).
14. Tighten two nuts (Figure 2, Item 9).

CAUTION

Do not overtighten cable clamps. Damage to equipment could occur.

15. Install two hose clamps (Figure 2, Item 1).

INSTALLATION - Continued

16. Install vapor recovery line dust cap (Figure 3, Item 1).

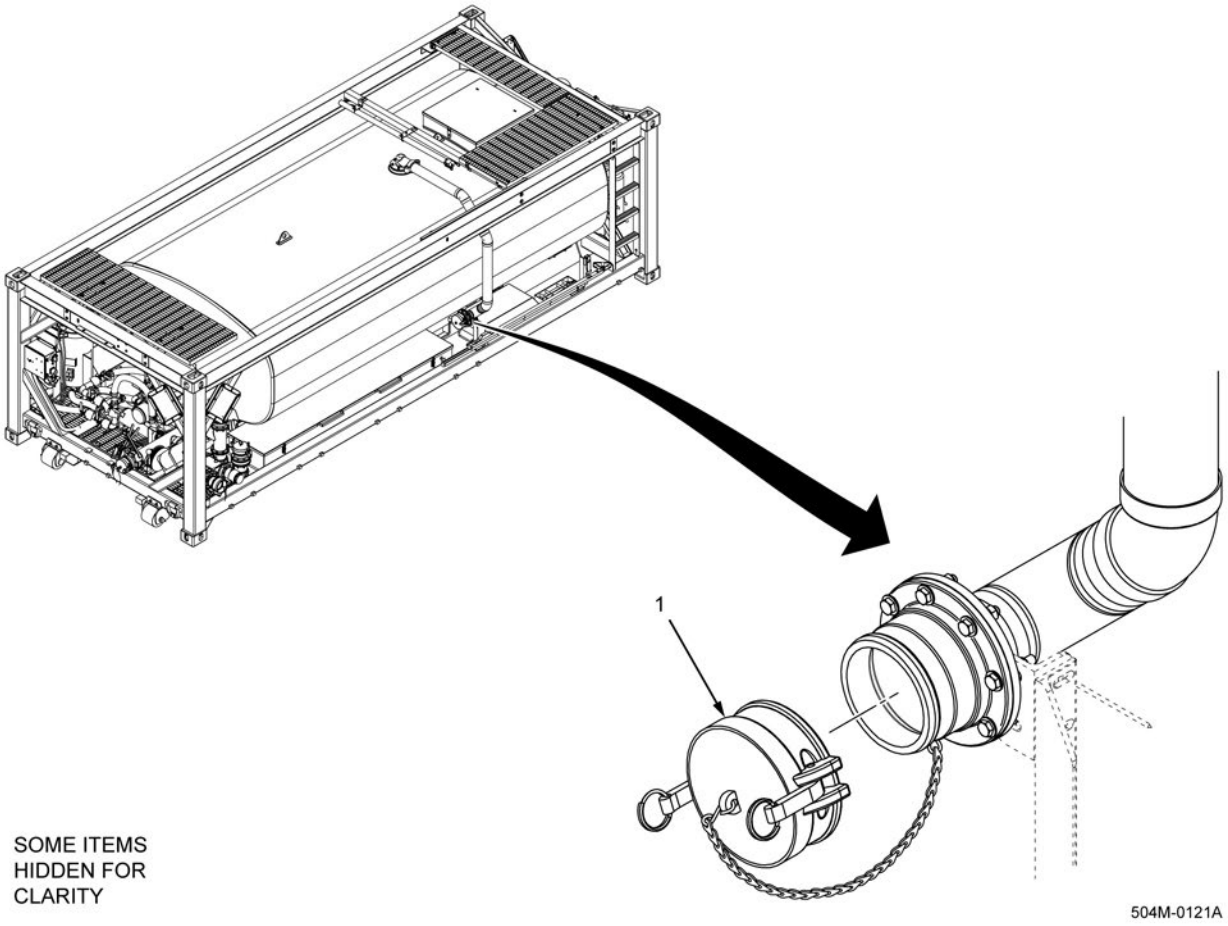


Figure 3. Installing Vapor Recovery Line Dust Cap.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Set up MFS TRM (TM 10-4930-371-10).
2. Check MFS TRM for leaks by recirculating fuel (TM 10-4930-371-10).

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
BOTTOM PIPING ASSEMBLY, REAR PIPING REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposable nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)
- Pan, drip (WP 0217, Table 1, Item 8)
- Wrench, adjustable, automotive (WP 0217, Table 1, Item 17)
- Wrench, internal pipe (WP 0217, Table 1, Item 18)

Materials/Parts
- Gasket (WP 0188, Figure 42, Item 3)
- Nut, Self-Locking, Hexagon (LOCKNUTS) Qty: 4 (WP 0188, Figure 42, Item 9)
- Rear Bottom Piping Assembly (WP 0188, Figure 42, Item 4)
- Absorbent material (WP 0216, Table 1, Item 1)
- Cable Tie (WP 0216, Table 1, Item 8)
- Cleaning compound, solvent (WP 0216, Table 1, Item 3)
- Cloth, cleaning (WP 0216, Table 1, Item 4)
- Thread sealing compound (WP 0216, Table 1, Item 15)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer (2)

References
- ATP 4-43
- TM 10-4930-371-10
- WP 0093
- WP 0144.5

Equipment Condition
- MFS TRM loaded on PLS trailer (TM 10-4930-371-10)
- MFS TRM grounded (TM 10-4930-371-10)
- MFS TRM drained (TM 10-4930-371-10)
- MFS TRM shut down (TM 10-4930-371-10)
- Port C Removed (WP 0093)
- MFS TRM ladder platform emplaced (TM 10-4930-371-10)
- MFS TRM ladder emplaced (TM 10-4930-371-10)

Time to Complete
- 3 Hour(s)

REMOVAL

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Failure to comply could result in injury or death to personnel.

1. Place drip pan as close as possible to rear bottom piping assembly (Figure 1, Item 7) to catch residual fuel.

NOTE

- Note orientation of hardware and components to aid in installation.
- Step 2 only applies to TRM with ADR.
- Steps 3 and 4 only apply to TRM without ADR.

2. Remove (V14) meter outlet valve (WP 0144.5) (TRM with ADR only).
3. Remove clamp (Figure 1, Item 23) and remove flexible hose (Figure 1, Item 22) from hose barb (Figure 1, Item 24).
4. Remove hose barb (Figure 1, Item 24) from rear bottom piping assembly (Figure 1, Item 7).
5. Cut cable tie (Figure 1, Item 8). Discard cable tie.
6. Remove two bolts (Figure 1, Item 12) and two nuts (Figure 1, Item 21) from coupling halves (Figure 1, Item 11) and remove coupling halves.
7. Remove two bolts (Figure 1, Item 13), flat washers (Figure 1, Item 16), grating clasps (Figure 1, Item 15), and locknuts (Figure 1, Item 17). Discard locknuts.
8. Remove two locknuts (Figure 1, Item 18), flat washers (Figure 1, Item 19), and U-bolt (Figure 1, Item 20) from bracket (Figure 1, Item 14). Remove bracket from MFS TRM.
9. Remove three hose clamps (Figure 1, Item 6) from rear bottom piping assembly (Figure 1, Item 7).
10. Remove two bolts (Figure 1, Item 2), nuts (Figure 1, Item 5), and coupling halves (Figure 1, Item 1) from rear bottom piping assembly (Figure 1, Item 7) and tee assembly (Figure 1, Item 3).
11. Remove rear bottom piping assembly (Figure 1, Item 7) from MFS TRM.
12. Remove and discard gaskets (Figure 1, Items 4 and 10).

REMOVAL - Continued

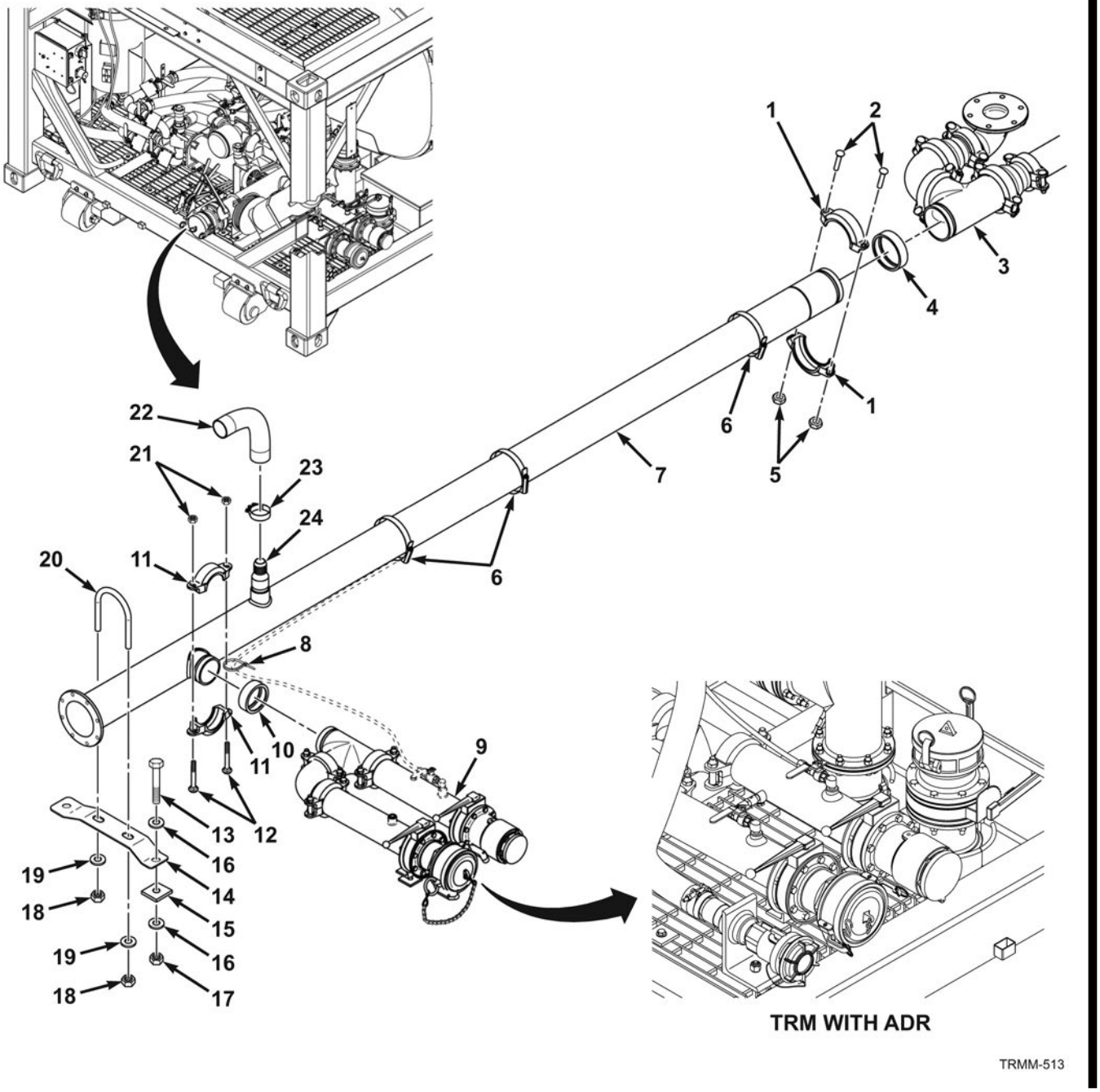


Figure 1. Rear Bottom Piping Assembly.

END OF TASK

CLEANING

WARNING

Solvent cleaning compound MIL-PRF-680 Type III is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Keep away from open flames and other sources of ignition. Failure to comply may cause injury to personnel.

1. Remove all dirt, oil, and debris from all mating surfaces and clamping areas.
2. Clean all metal parts with a cleaning cloth and solvent cleaning compound.
3. Allow parts to dry thoroughly.

END OF TASK

INSTALLATION

1. Lubricate new gaskets (Figure 1, Items 4 and 10) with fuel and install on rear bottom piping assembly (Figure 1, Item 7).
2. Position rear bottom piping assembly (Figure 1, Item 7) on MFS TRM.
3. Install rear bottom piping assembly (Figure 1, Item 7) on bottom tee assembly (Figure 1, Item 3).
4. Slide gasket (Figure 1, Item 4) onto bottom tee assembly (Figure 1, Item 3) so that half of the gasket (Figure 1, Item 4) remains on the rear bottom piping assembly (Figure 1, Item 7).
5. Install two coupling halves (Figure 1, Item 1) and secure with two bolts (Figure 1, Item 2) and two nuts (Figure 1, Item 5). Ensure coupling halves are touching.
6. Slide new gasket (Figure 1, Item 10) onto right side piping assembly (Figure 1, Item 9) so that half of the gasket (Figure 1, Item 10) remains on the rear bottom piping assembly (Figure 1, Item 7).
7. Install two coupling halves (Figure 1, Item 11) and secure with two bolts (Figure 1, Item 12) and two nuts (Figure 1, Item 21). Ensure coupling halves are touching.
8. Install bracket (Figure 1, Item 14) and secure with U-bolt (Figure 1, Item 20) on rear bottom piping assembly (Figure 1, Item 7), two flat washers (Figure 1, Item 19), and two new locknuts (Figure 1, Item 18).
9. Install two bolts (Figure 1, Item 13), four flat washers (Figure 1, Item 16), two grating clasps (Figure 1, Item 15), and two locknuts (Figure 1, Item 17).
10. Install (V14) meter outlet valve (WP 0144.5) (TRM with ADR only).

INSTALLATION - Continued

WARNING

Thread sealing compound is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Failure to comply may cause injury to personnel.

NOTE

Steps 11, 12, and 13 are for TRM without ADR only.

11. Apply thread sealing compound on hose barb threads (Figure 1, Item 24).
12. Install hose barb (Figure 1, Item 24) on rear bottom piping assembly (Figure 1, Item 7).
13. Install flexible hose (Figure 1, Item 22) on hose barb (Figure 1, Item 24) with hose clamp (Figure 1, Item 23).

CAUTION

Do not overtighten cable clamps. Damage to equipment could occur.

14. Install three hose clamps (Figure 1, Item 6) on rear bottom piping assembly (Figure 1, Item 7). Ensure hose clamps (Figure 1, Item 6) secure lines to pipe as noted during removal.
15. Install new cable tie (Figure 1, Item 8).

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install Port C (WP 0093).
2. Set up MFS TRM (TM 10-4930-371-10).
3. Check MFS TRM for leaks by recirculating fuel (TM 10-4930-371-10).

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
STRAINER ASSEMBLY REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposable nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)
- Pan, drip (WP 0217, Table 1, Item 8)
- Pliers, multiple position (WP 0217, Table 1, Item 9)
- Vise, machinist's (WP 0217, Table 1, Item 14)
- Wire Brush (WP 0217, Table 1, Item 15)
- Wrench, adjustable, 15" (WP 0217, Table 1, Item 16)
- Wrench, internal pipe (WP 0217, Table 1, Item 18)
- Wrench, pipe, 18 inch (WP 0217, Table 1, Item 19)

Materials/Parts
- Absorbent material (WP 0216, Table 1, Item 1)
- Cable Tie (WP 0216, Table 1, Item 14)
- Cable Tie (WP 0216, Table 1, Item 8)
- Cleaning compound, solvent (WP 0216, Table 1, Item 3)

Materials/Parts (cont.)
- Sealing compound (WP 0216, Table 1, Item 13)
- Thread sealing compound (WP 0216, Table 1, Item 15)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer (2)

References
- ATP 4-43
- TM 10-4930-371-10
- WP 0144.6

Equipment Condition
- MFS TRM grounded (TM 10-4930-371-10)
- MFS TRM shut down (TM 10-4930-371-10)
- MFS TRM drained (TM 10-4930-371-10)
- MFS TRM loaded on PLS trailer (TM 10-4930-371-10)

Time to Complete
- 2.6 Hour(s)

REMOVAL

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Failure to comply could result in injury or death to personnel.

NOTE

For TRM with ADR, refer to (WP 0144.6).

1. Remove the valve adapter assembly (Figure 1, Item 3):
   a. Remove spring (Figure 1, Item 2) on bottom of valve adapter assembly (Figure 1, Item 3).
   b. Open the levers (Figure 1, Item 1) and remove valve adapter assembly (Figure 1, Item 3).

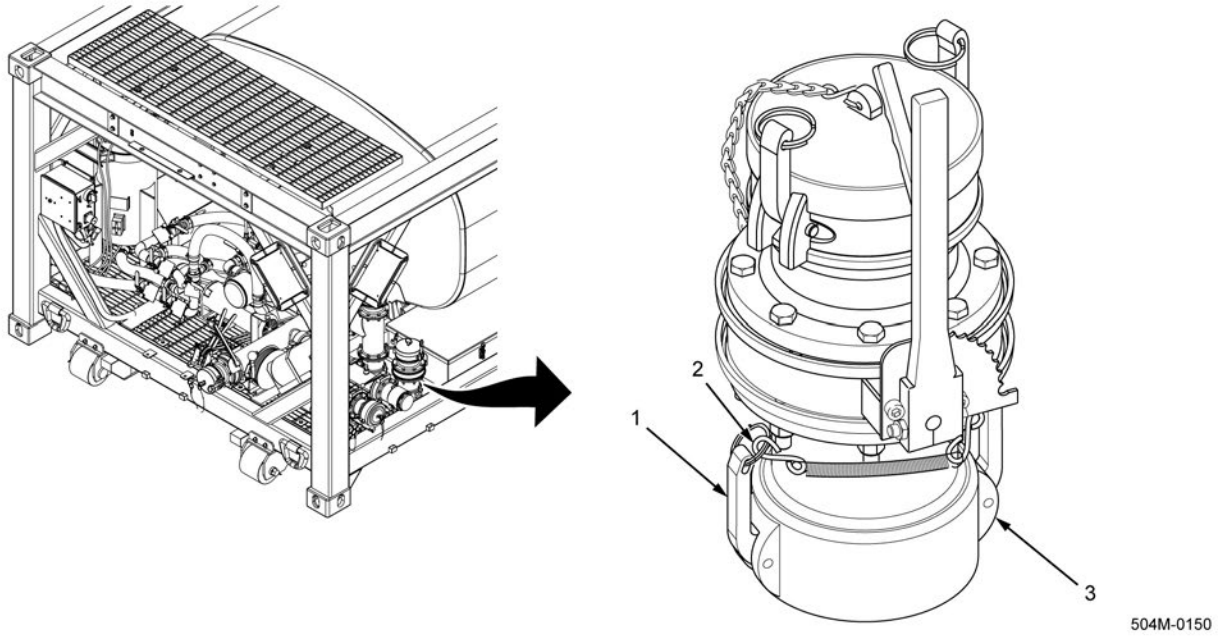


Figure 1. Valve Adapter Assembly Removal.

REMOVAL - Continued

2. Remove the tee assembly (Figure 2, Item 3):
   a. Remove spring (Figure 2, Item 2) on bottom of tee assembly (Figure 2, Item 3).
   b. Open the levers (Figure 2, Item 1) and remove the tee assembly (Figure 2, Item 3).

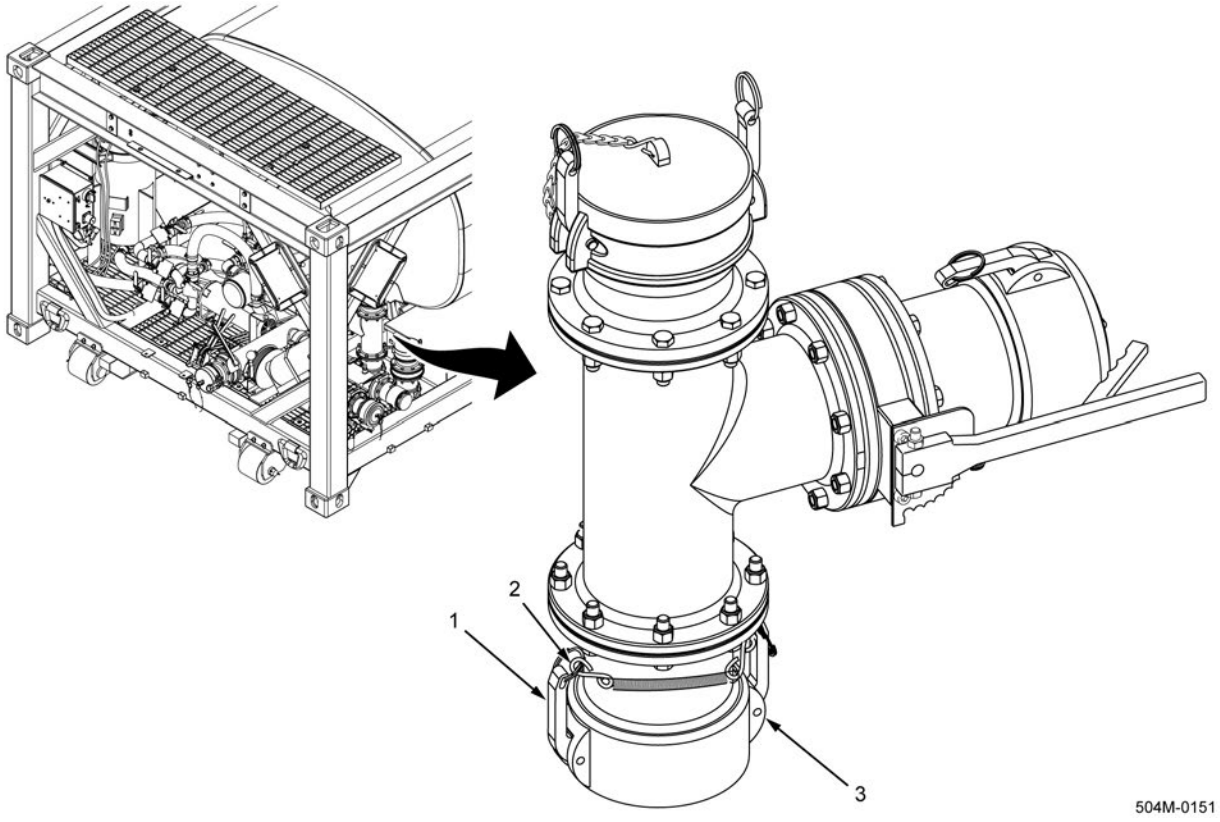


Figure 2. Tee Assembly Removal.

3. Remove vapor recovery line dust cap (Figure 3, Item 2).
4. Momentarily open then close bottom loading valve (V1) (Figure 3, Item 1) to vent tank pressure.

REMOVAL - Continued

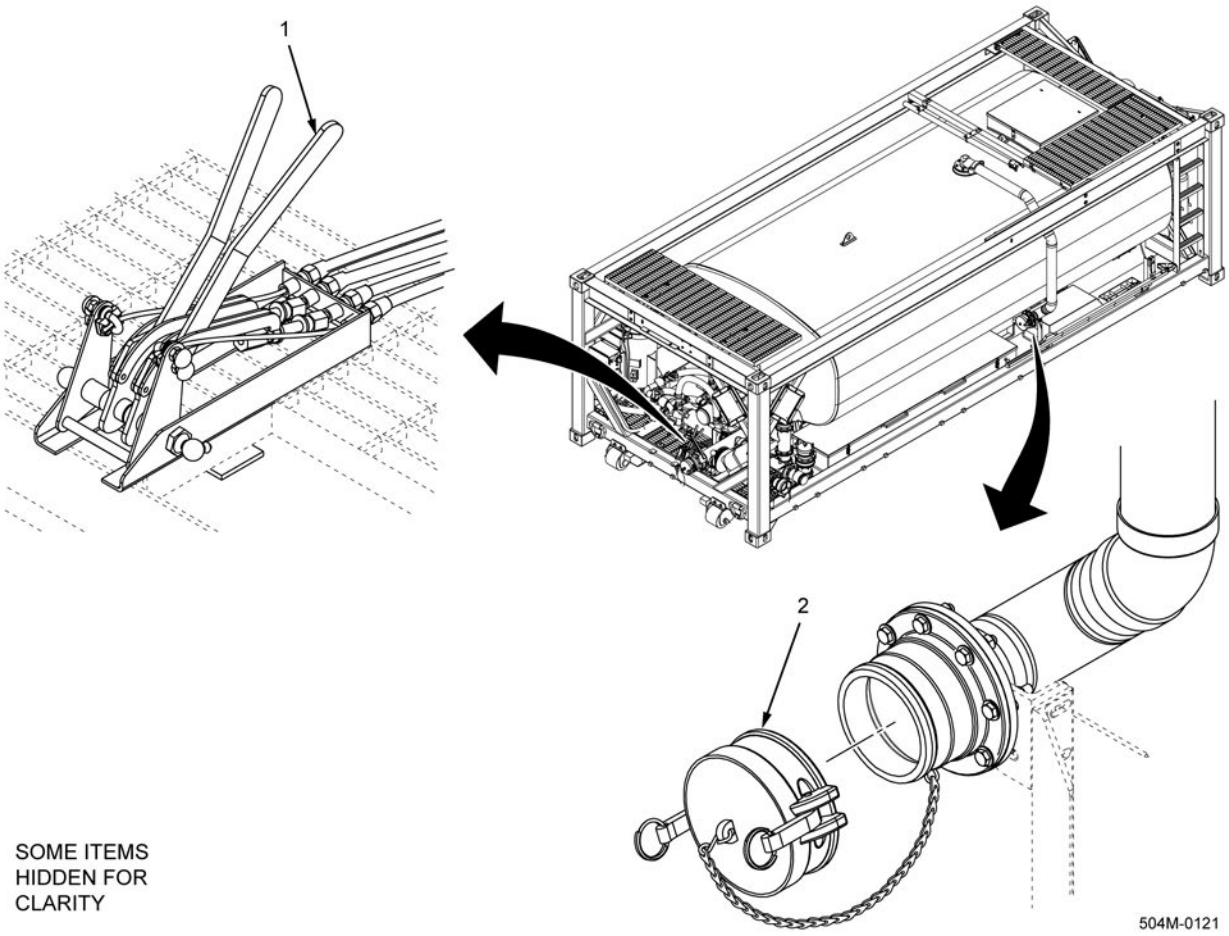


Figure 3. Fuel System Venting.

WARNING

There will be residual fuel in piping, which may be under slight pressure which will be released in the following step. Take care to prevent fuel from being sprayed into face. Failure to comply may result in injury or death to personnel.

5. Place drip pan as close as possible under strainer assembly (Figure 4, Item 1) to catch residual fuel.
6. Loosen jam nut (Figure 4, Item 4).
7. Unscrew bolt (Figure 4, Item 3) enough to loosen yoke (Figure 4, Item 2) and cap (Figure 4, Item 5) and allow residual fuel to drain.
8. Tighten bolt (Figure 4, Item 3) after all fuel has been drained.

REMOVAL - Continued

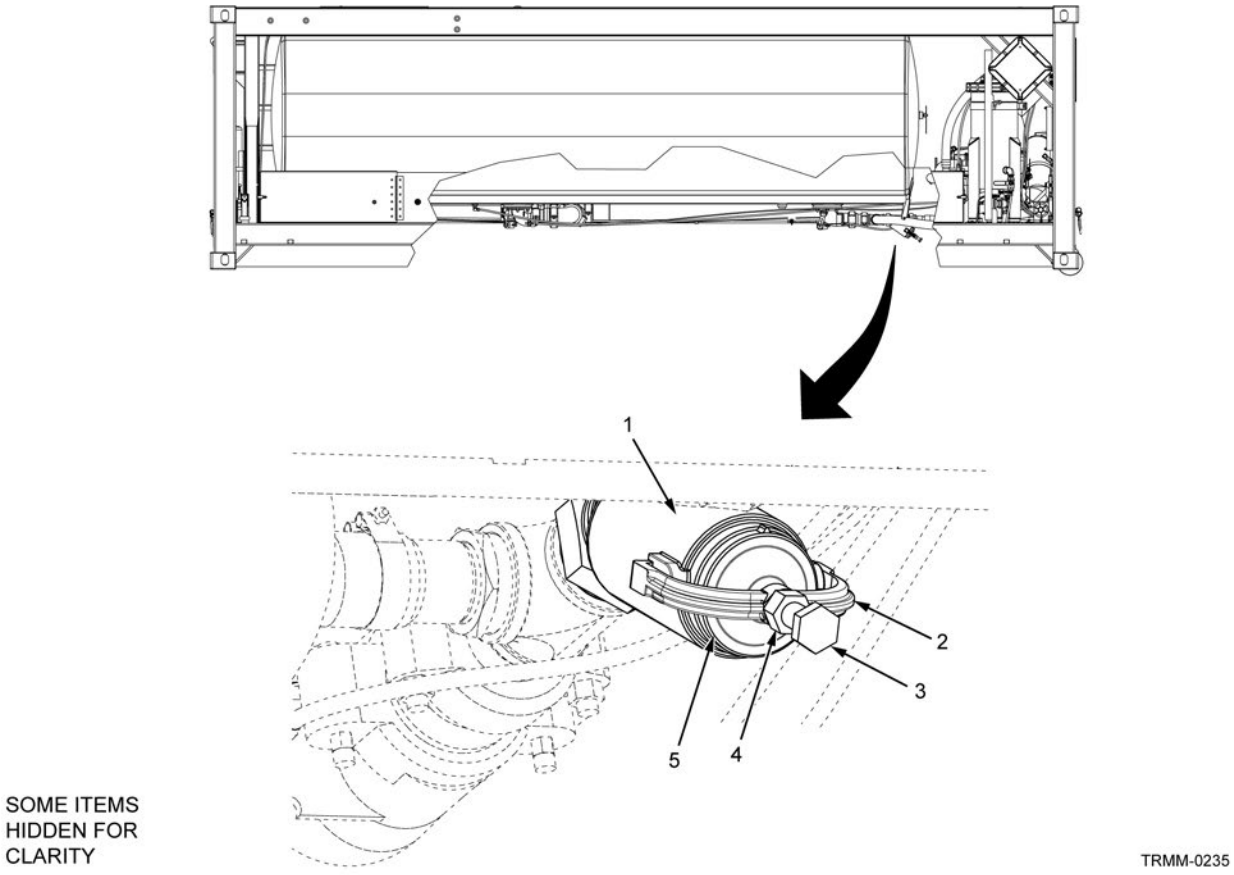


Figure 4. Draining Strainer.

9. Remove bolt (Figure 5, Item 1), two flat washers (Figure 5, Item 5), and locknut (Figure 5, Item 4) and remove loop clamp (Figure 5, Item 2) from flexible hose (Figure 5, Item 3). Discard locknut.

REMOVAL - Continued

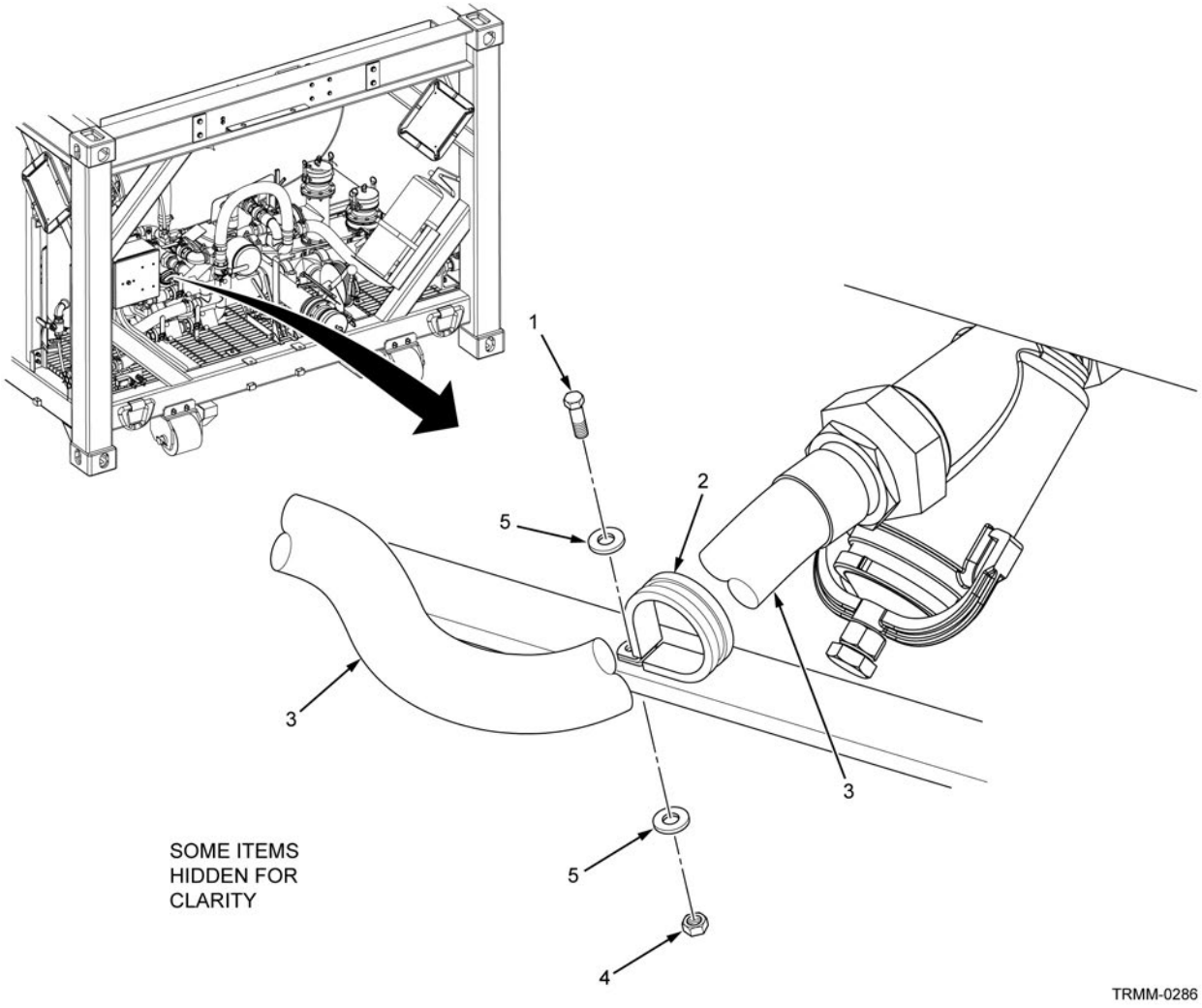


Figure 5. Removing Loop Clamp and Cable Tie.

REMOVAL - Continued

10. Remove and discard cable tie (Figure 6, Item 11).
11. Remove hose clamp (Figure 6, Item 7), disconnect flexible hose (Figure 6, Item 10) from hose barb (Figure 6, Item 9).
12. Remove hose clamp (Figure 6, Item 7) and disconnect flexible hose (Figure 6, Item 8) from hose barb (Figure 6, Item 6).

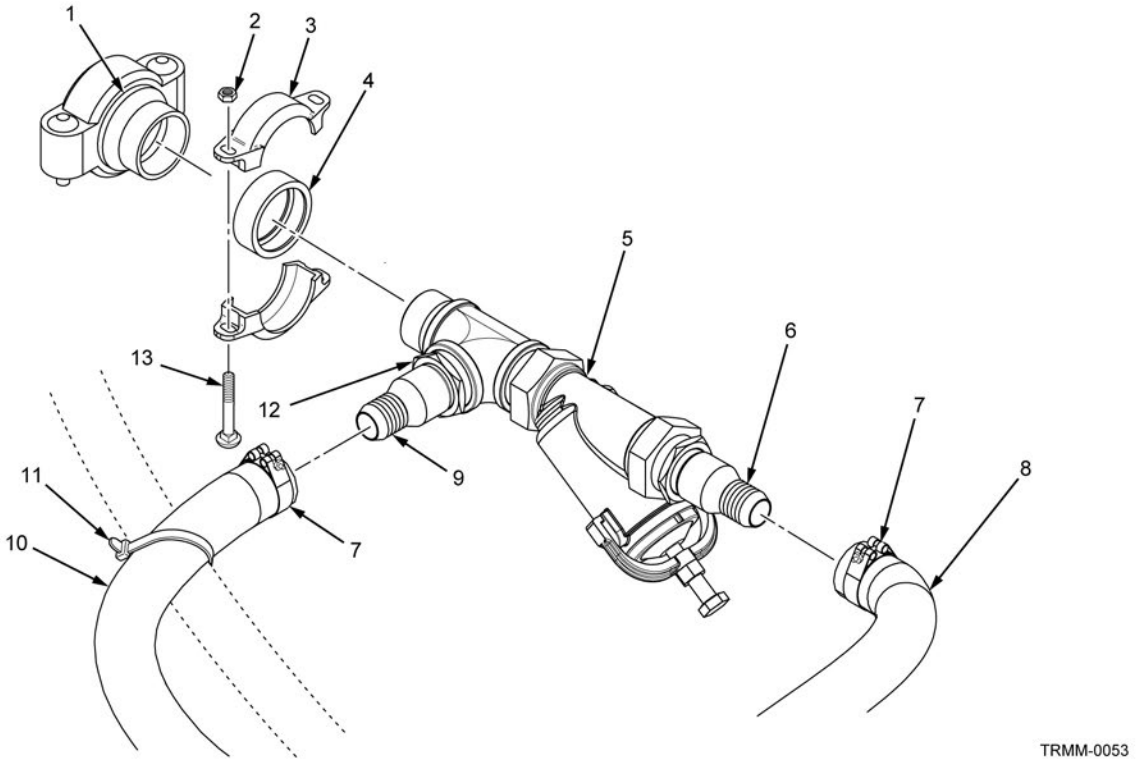


Figure 6. Removing Strainer.

NOTE

Strainer assembly and attached fittings must be supported during removal of coupling halves.

13. While supporting strainer assembly (Figure 6, Item 5), remove two bolts (Figure 6, Item 13), nuts (Figure 6, Item 2), and coupling halves (Figure 6, Item 3).
14. While supporting strainer assembly (Figure 6, Item 5), slide coupling gasket (Figure 6, Item 4) onto reducer (Figure 6, Item 1) and remove strainer assembly (Figure 6, Item 5) with pipe assembly (Figure 6, Item 12).
15. Remove and discard coupling gasket (Figure 6, Item 4).
16. Dispose of fuel IAW unit SOP.
17. Mark strainer assembly (Figure 6, Item 5) and pipe assembly (Figure 6, Item 12) to indicate proper alignment during installation.

END OF TASK

DISASSEMBLY

NOTE

Note all connections to aid in assembly.

1. Place strainer assembly in vise.
2. Remove hose barb (Figure 7, Item 8) from bushing (Figure 7, Item 7).
3. Remove bushing (Figure 7, Item 7) from strainer assembly (Figure 7, Item 6).
4. Remove hose barb (Figure 7, Item 1) from bushing (Figure 7, Item 2).
5. Remove bushing (Figure 7, Item 2) from tee (Figure 7, Item 4).
6. Remove nipple (Figure 7, Item 3) from tee (Figure 7, Item 4).
7. Remove tee (Figure 7, Item 4) from nipple (Figure 7, Item 5).
8. Remove nipple (Figure 7, Item 5) from strainer assembly (Figure 7, Item 6).

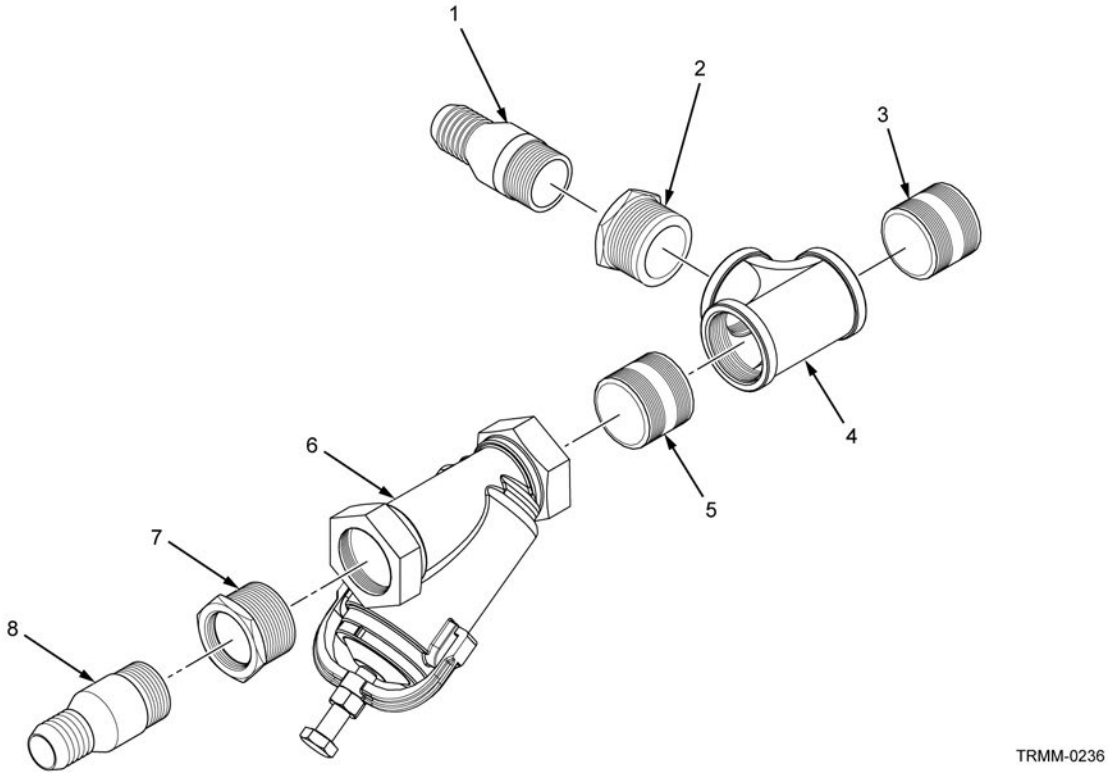


Figure 7. Strainer Assembly Disassembly.

DISASSEMBLY - Continued

9. Disassemble strainer assembly to the extent required to remove faulty components as follows:
   a. Loosen jam nut (Figure 8, Item 6) and loosen bolt (Figure 8, Item 7) to release yoke (Figure 8, Item 5).
   b. Remove yoke (Figure 8, Item 5), cap (Figure 8, Item 4) and gasket (Figure 8, Item 3) from strainer body (Figure 8, Item 1).
   c. Remove strainer screen (Figure 8, Item 2) from strainer body (Figure 8, Item 1).
   d. Remove gasket (Figure 8, Item 3) from cap (Figure 8, Item 4). Discard gasket (Figure 8, Item 3).
   e. Remove bolt (Figure 8, Item 7) and jam nut (Figure 8, Item 6) from yoke (Figure 8, Item 5).
   f. Remove jam nut (Figure 8, Item 6) from bolt (Figure 8, Item 7).

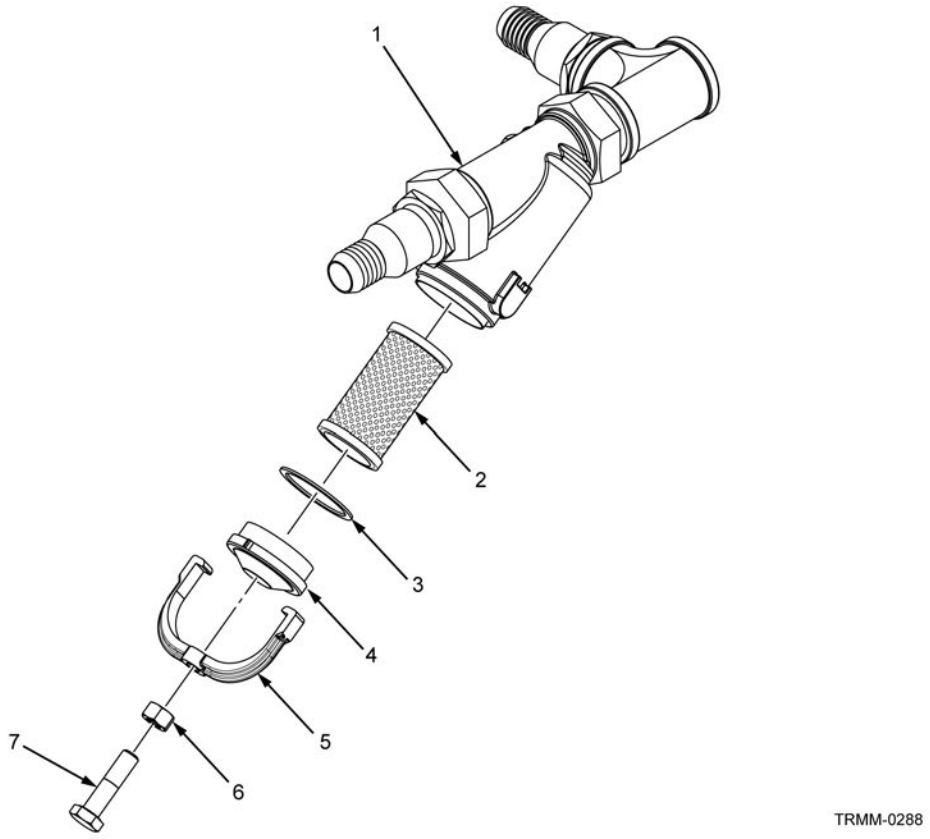


Figure 8. Strainer Assembly Disassembly.

END OF TASK

CLEANING

WARNING

Solvent cleaning compound MIL-PRF-680 Type III is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Keep away from open flames and other sources of ignition. Failure to comply may cause injury to personnel.

1. Clean any residual thread sealant from threads of all components.
2. Clean all metal parts with a cleaning cloth and solvent cleaning compound.
3. Allow parts to dry thoroughly.

END OF TASK

ASSEMBLY

WARNING

Thread sealing compound is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Failure to comply may cause injury to personnel.

1. Apply thread sealing compound to all threads.
2. Place tee (Figure 7, Item 4) in vise.
3. Install nipple (Figure 7, Item 3) on tee (Figure 7, Item 4).
4. Install bushing (Figure 7, Item 2) on tee (Figure 7, Item 4).
5. Install hose barb (Figure 7, Item 1) on bushing (Figure 7, Item 2).
6. Install nipple (Figure 7, Item 5) on strainer assembly (Figure 7, Item 6).
7. Install tee (Figure 7, Item 4) on nipple (Figure 7, Item 5).
8. Install bushing (Figure 7, Item 7) on strainer assembly (Figure 7, Item 6).
9. Install hose barb (Figure 7, Item 8) on bushing (Figure 7, Item 7).
10. Assemble strainer assembly components as follows:
    a. Install jam nut (Figure 9, Item 6) on bolt (Figure 9, Item 7). Thread jam nut (Figure 9, Item 6) all the way onto bolt (Figure 9, Item 7).
    b. Screw bolt (Figure 9, Item 7) into yoke (Figure 9, Item 5).
    c. Install new gasket (Figure 9, Item 3) on cap (Figure 9, Item 4).
    d. Install strainer screen (Figure 9, Item 2) in strainer body (Figure 9, Item 1).
    e. Place cap (Figure 9, Item 4) and yoke (Figure 9, Item 5) on strainer body (Figure 9, Item 1).

ASSEMBLY - Continued

f. Tighten bolt (Figure 9, Item 7) to secure yoke (Figure 9, Item 5) to the cap (Figure 9, Item 4) on strainer body (Figure 9, Item 1).

g. Tighten jam nut (Figure 9, Item 6) down on to yoke (Figure 9, Item 5) to secure cap (Figure 9, Item 4) in place.

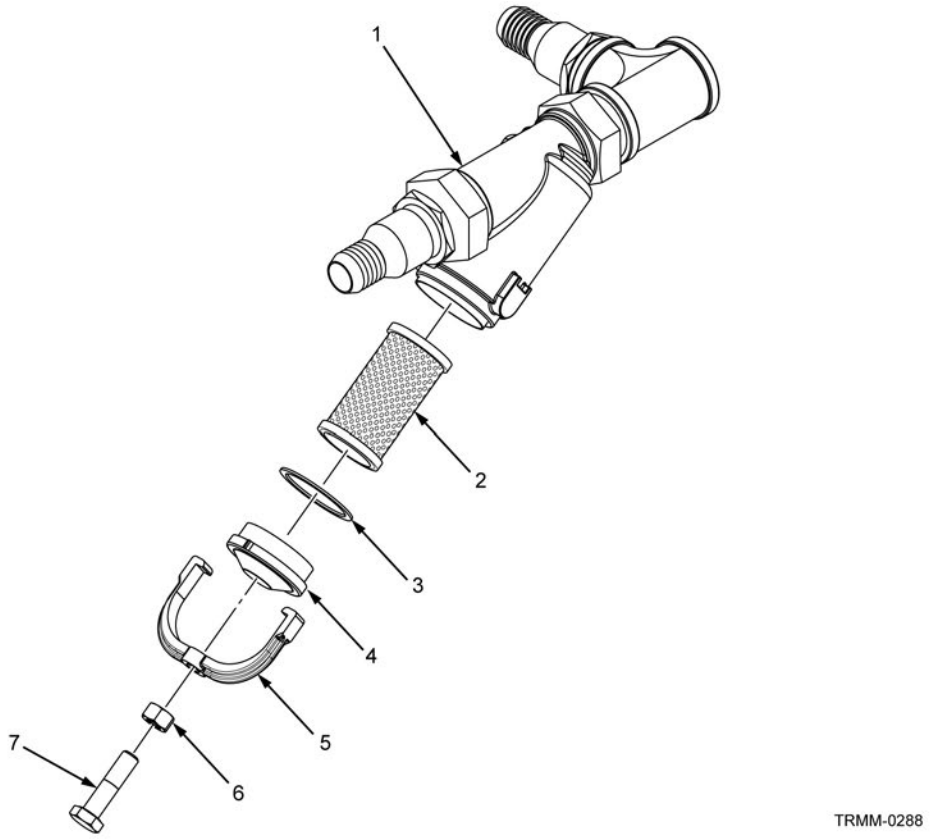


Figure 9. Strainer Assembly.

END OF TASK

INSTALLATION

1. Lightly lubricate new coupling gasket (Figure 10, Item 4) with fuel.
2. Install new coupling gasket (Figure 10, Item 4) on reducer (Figure 10, Item 1).

NOTE

Strainer assembly and assembled fittings must be supported during installation in the following steps.

3. Install entire strainer assembly (Figure 10, Item 5) and align with reducer (Figure 10, Item 1).
4. Slide new coupling gasket (Figure 10, Item 4) into place between reducer (Figure 10, Item 1) and coupling adapter (Figure 10, Item 5).

INSTALLATION - Continued

5. Install coupling halves (Figure 10, Item 3), and loosely secure with two nuts (Figure 10, Item 2) and bolts (Figure 10, Item 13).
6. Ensure coupling gasket (Figure 10, Item 4) is in place and tighten two nuts (Figure 10, Item 2) and bolts (Figure 10, Item 13) until coupling halves (Figure 10, Item 3) are contacting each other on each side.
7. Connect flexible hose (Figure 10, Item 9) to hose barb (Figure 10, Item 7) and install hose clamp (Figure 10, Item 8).
8. Connect flexible hose (Figure 10, Item 11) to hose barb (Figure 10, Item 10) on piping (Figure 10, Item 12) and install hose clamp (Figure 10, Item 8).

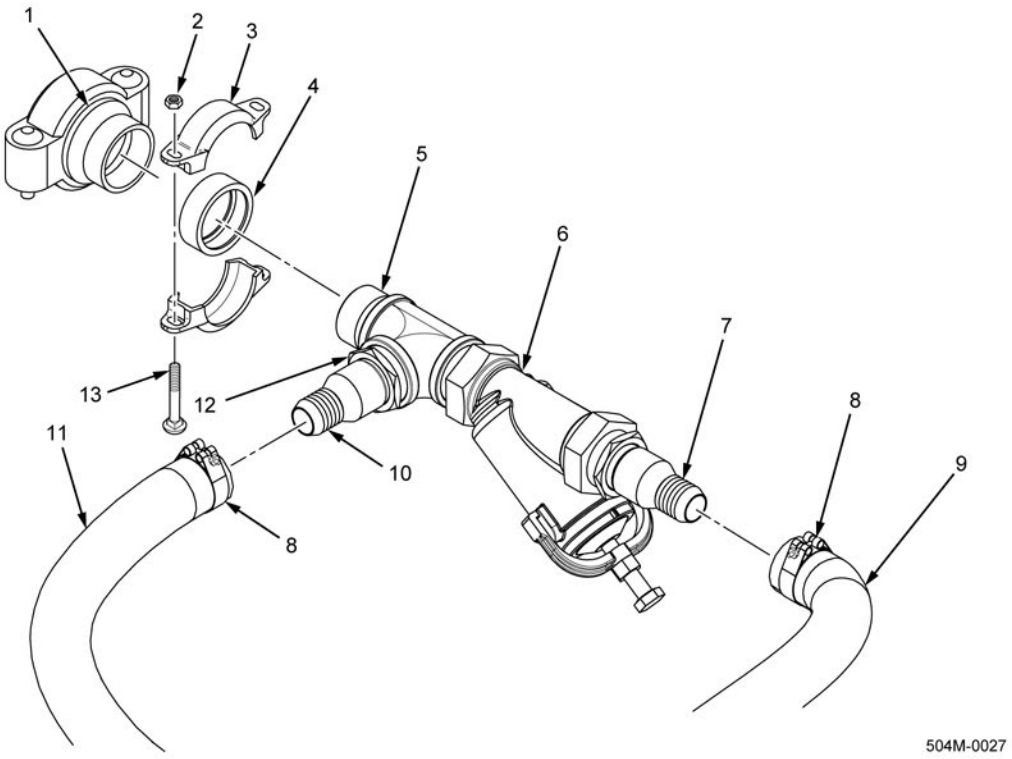


Figure 10. Installing Strainer Assembly.

INSTALLATION - Continued

9. Install loop clamp (Figure 11, Item 2) around flexible hose (Figure 11, Item 3) and secure with bolt (Figure 11, Item 1), two flat washers (Figure 11, Item 5), and new locknut (Figure 11, Item 4).
10. Install new cable tie (Figure 6, Item 11) onto flexible hose and trim off excess.

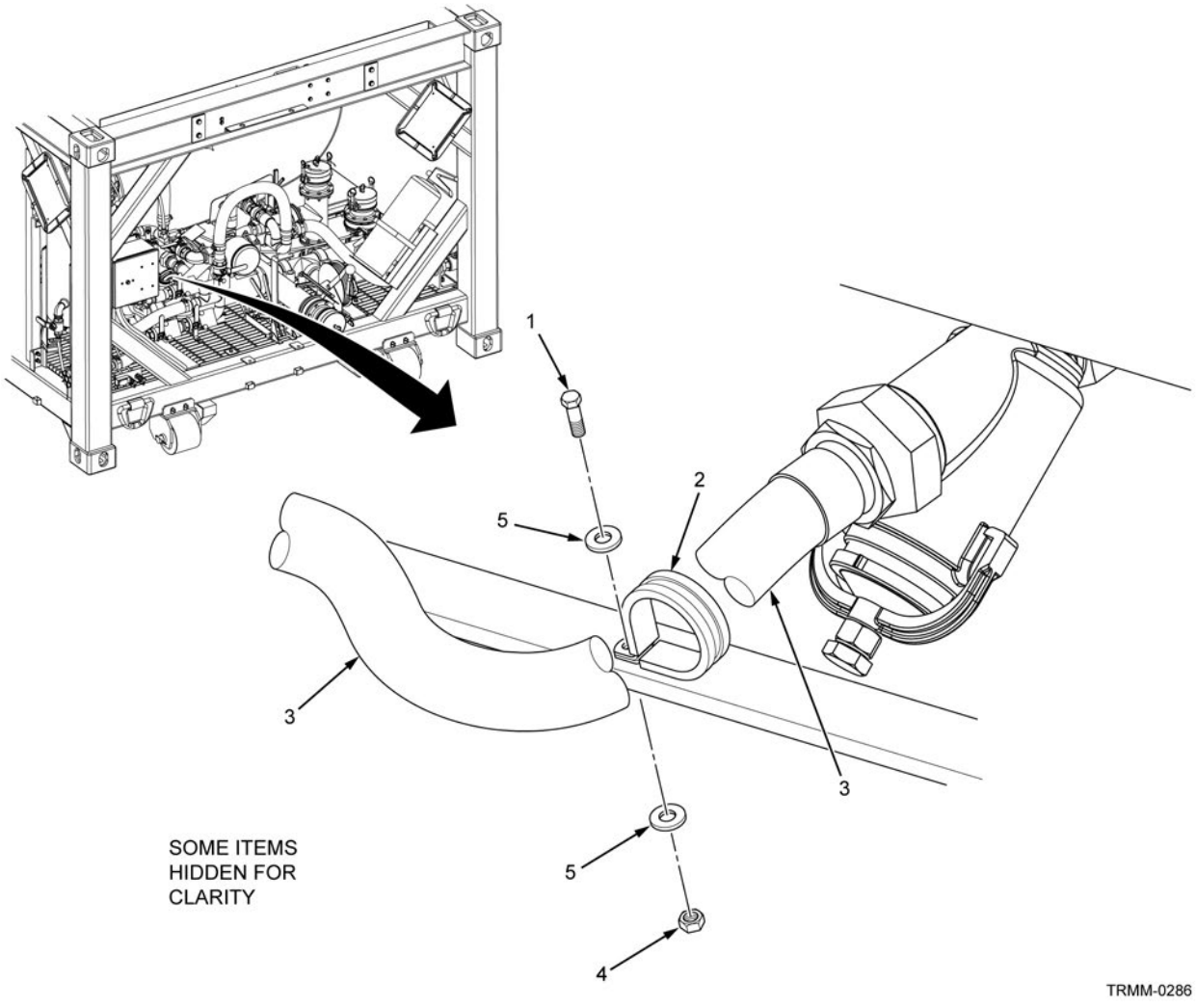


Figure 11. Installing Loop Clamp.

11. Install the tee assembly (Figure 12, Item 3):
    a. Install the tee assembly (Figure 12, Item 3).
    b. Install spring (Figure 12, Item 2) on bottom of tee assembly (Figure 12, Item 3) and close the levers (Figure 12, Item 1).

INSTALLATION - Continued

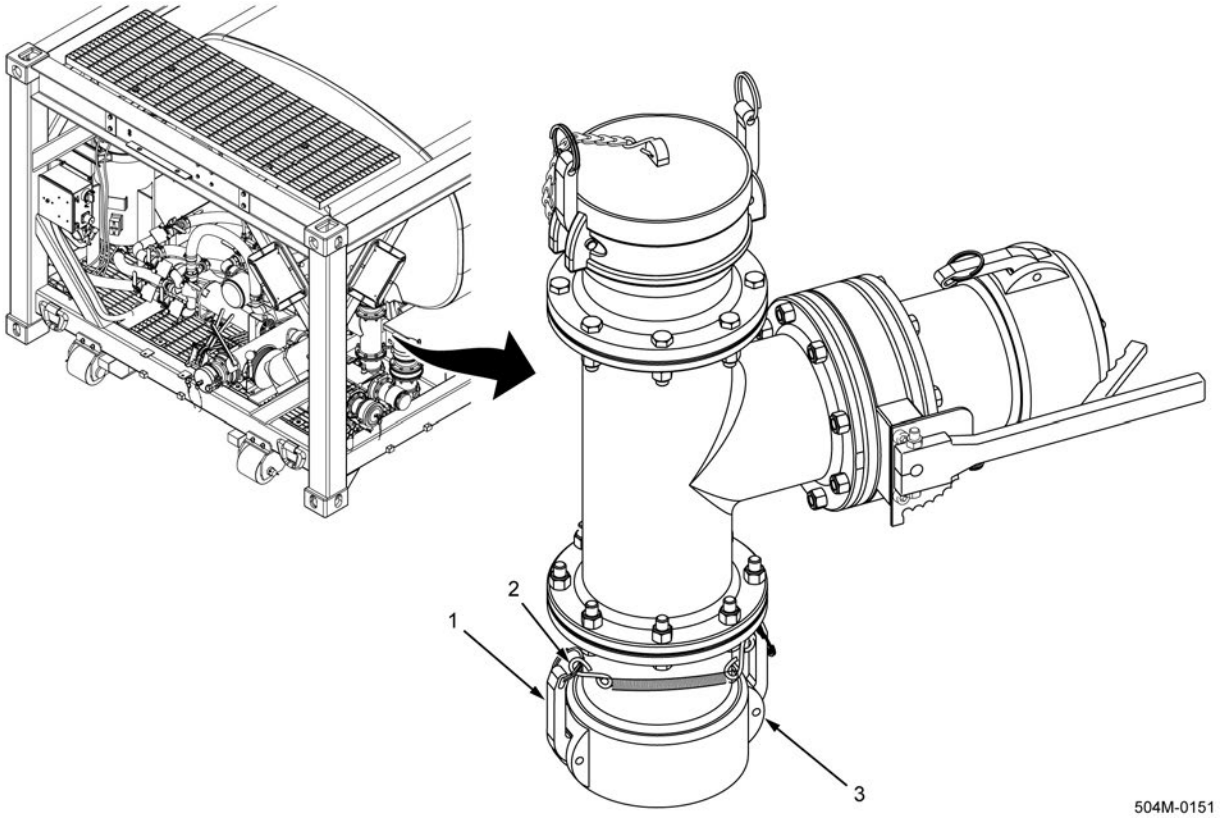


Figure 12. Tee Assembly Installation.

12. Install the valve adapter assembly (Figure 13, Item 3):
    a. Install valve adapter assembly (Figure 13, Item 3).
    b. Install spring (Figure 13, Item 2) on bottom of valve adapter assembly (Figure 13, Item 3). Close the levers (Figure 13, Item 1) .

INSTALLATION - Continued

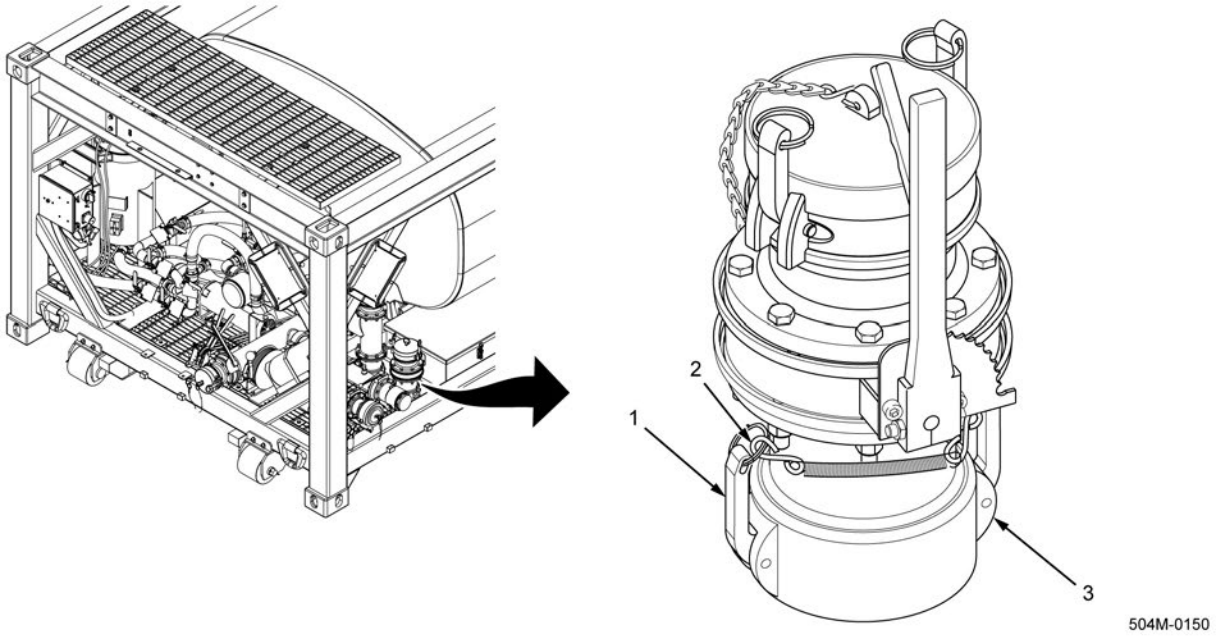


Figure 13. Valve Adapter Assembly Installation.

13. Install vapor recovery line dust cap (Figure 14, Item 1).

INSTALLATION - Continued

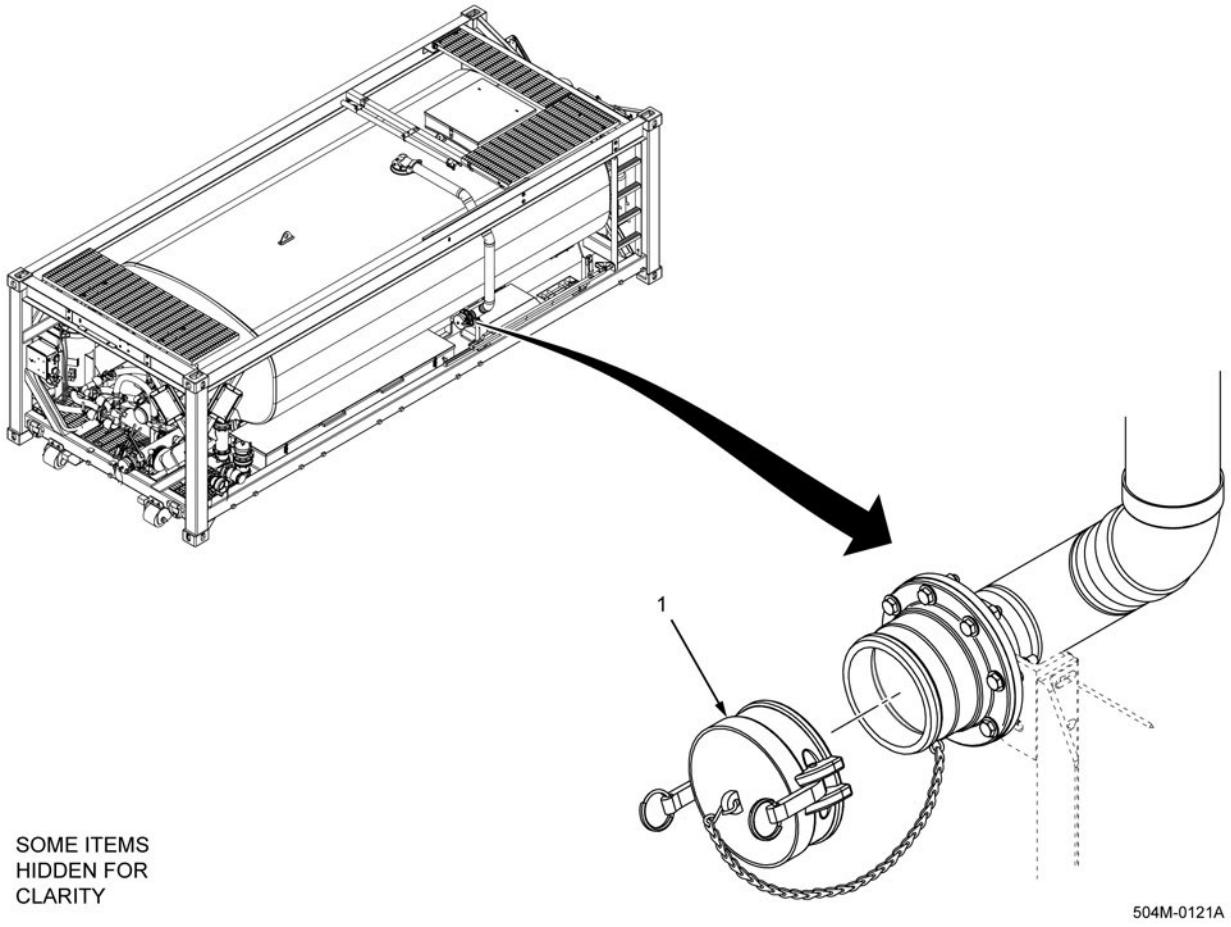


Figure 14. Installing Vapor Recovery Line Dust Cap.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Set up MFS TRM (TM 10-4930-371-10).
2. Check MFS TRM for leaks by recirculating fuel (TM 10-4930-371-10).

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
STRAINER ASSEMBLY BASKET REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposable nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)
- Pan, drip (WP 0217, Table 1, Item 8)

Materials/Parts
- Absorbent material (WP 0216, Table 1, Item 1)
- Cleaning compound, solvent (WP 0216, Table 1, Item 3)
- Cloth, cleaning (WP 0216, Table 1, Item 4)
- Gasket (WP 0189, Figure 43, Item 9)
- Strainer basket (WP 0189, Figure 43, Item 8)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer

References
- ATP 4-43
- TM 10-4930-371-10

Equipment Condition
- MFS TRM shut down (TM 10-4930-371-10)
- MFS TRM grounded (TM 10-4930-371-10)
- MFS TRM drained (TM 10-4930-371-10)
- MFS TRM loaded on PLS trailer (TM 10-4930-371-10)

Time to Complete
- 0.5 Hour(s)

REMOVAL

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Failure to comply could result in injury or death to personnel.

1. Remove vapor recovery line dust cap (Figure 1, Item 2).
2. Momentarily open then close (V1) bottom loading valve (Figure 1, Item 1) to vent tank pressure.

REMOVAL - Continued

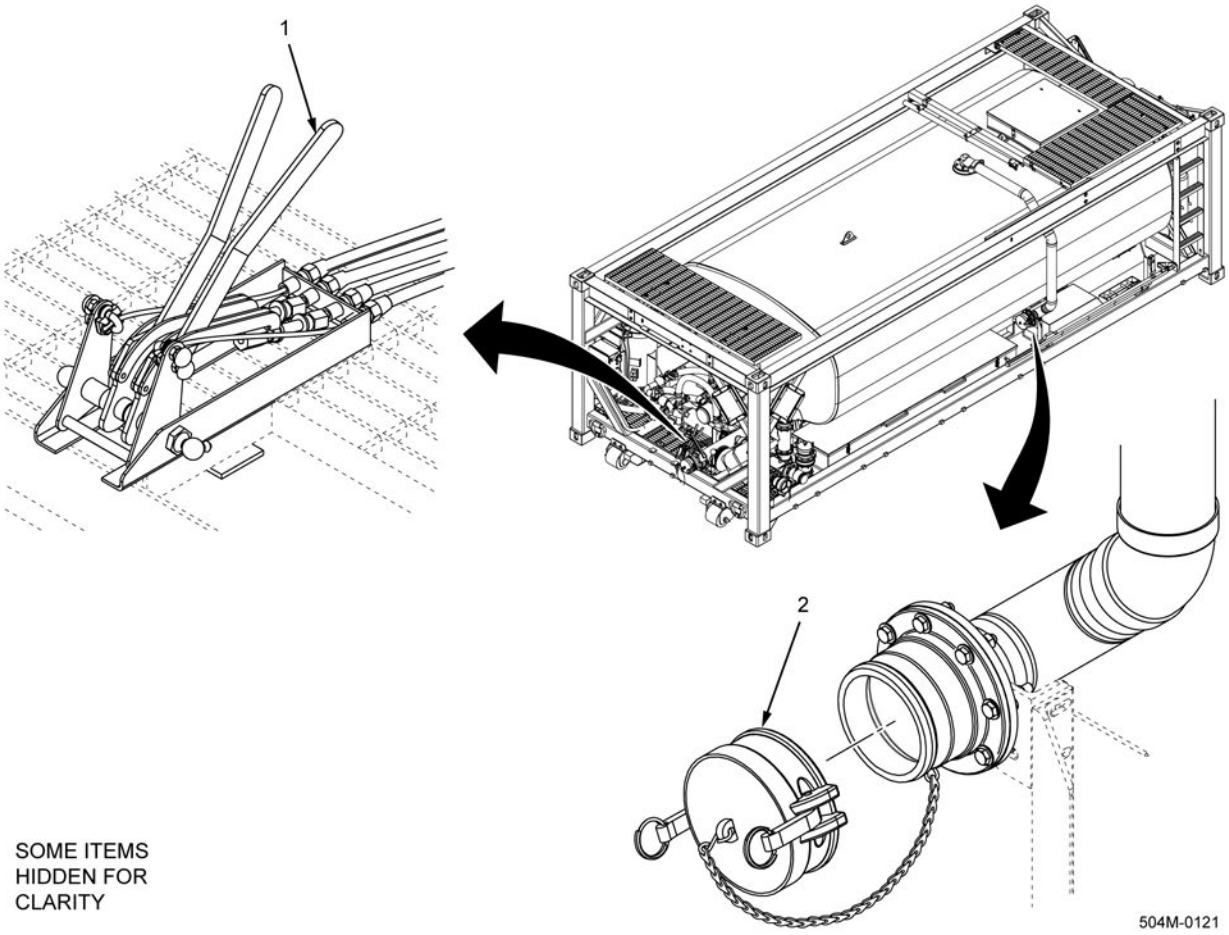


Figure 1. Fuel System Venting.

3. Ensure all valves (V1) through (V16) are closed (TM 10-4930-371-10).
4. Place drip pan under strainer to catch residual fuel.

REMOVAL - Continued

NOTE

Strainer assembly may turn when removing jam nut if not held.

5. Hold yoke (Figure 2, Item 5) to prevent it from turning, loosen jam nut (Figure 2, Item 6).

WARNING

Strainer will contain residual fuel which will be released in the following step. Take care not to allow fuel to splash into face. Failure to comply could result in injury or death to personnel.

6. Loosen bolt (Figure 2, Item 7) and allow fuel to drain into drip pan.
7. Once all fuel has drained, continue to loosen bolt to allow yoke (Figure 2, Item 5) to be released.
8. Release yoke (Figure 2, Item 5) from strainer (Figure 2, Item 1) and remove cap (Figure 2, Item 4).
9. Remove gasket (Figure 2, Item 3) from cap (Figure 2, Item 4). Discard gasket.
10. Remove strainer basket (Figure 2, Item 2).

REMOVAL - Continued

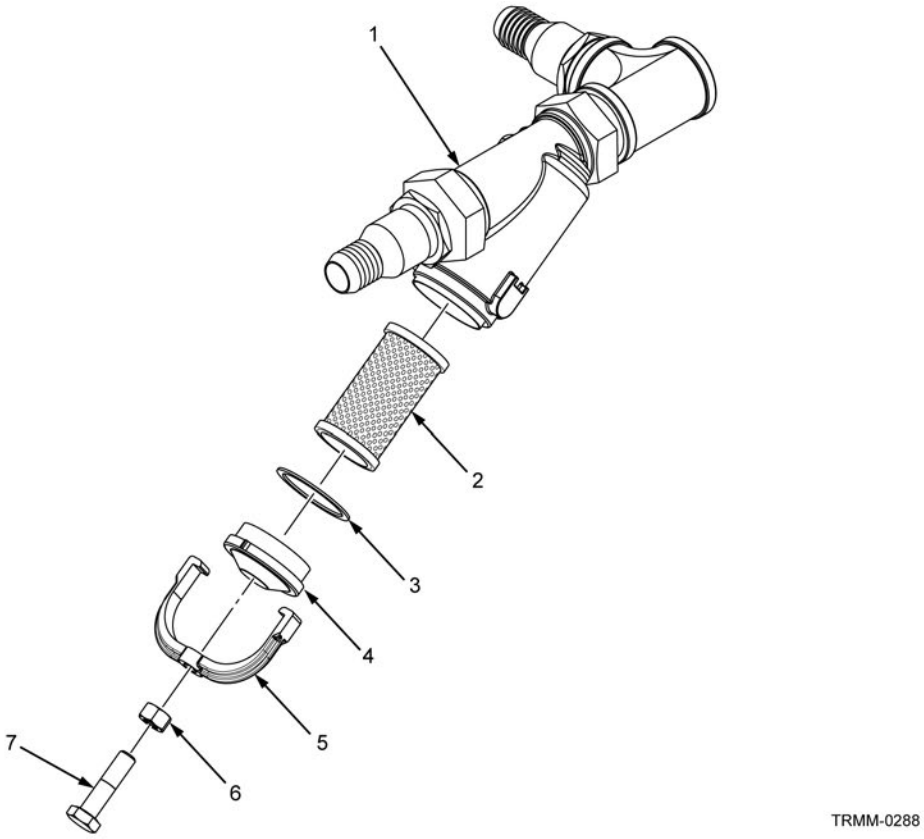


Figure 2. Strainer Basket Removal.

END OF TASK

CLEANING

WARNING

Solvent cleaning compound MIL-PRF-680 Type III is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Keep away from open flames and other sources of ignition. Failure to comply may cause injury to personnel.

1. Remove any residual gasket material from mating surfaces.
2. Using solvent and cleaning cloth, clean debris from strainer screen (Figure 3, Item 2).
3. Allow all parts to dry thoroughly.

END OF TASK

INSTALLATION

1. Insert strainer basket (Figure 3, Item 2) into strainer (Figure 3, Item 1).
2. Install new gasket (Figure 3, Item 3) on cap (Figure 3, Item 4).
3. Install yoke (Figure 3, Item 5) in place.

NOTE

Strainer assembly may turn when removing jam nut if not held.

4. Hold yoke (Figure 3, Item 5) to prevent it from turning, tighten bolt (Figure 3, Item 7) to secure.
5. Hold yoke (Figure 3, Item 5) to prevent it from turning, tighten jam nut (Figure 3, Item 6) to secure yoke.

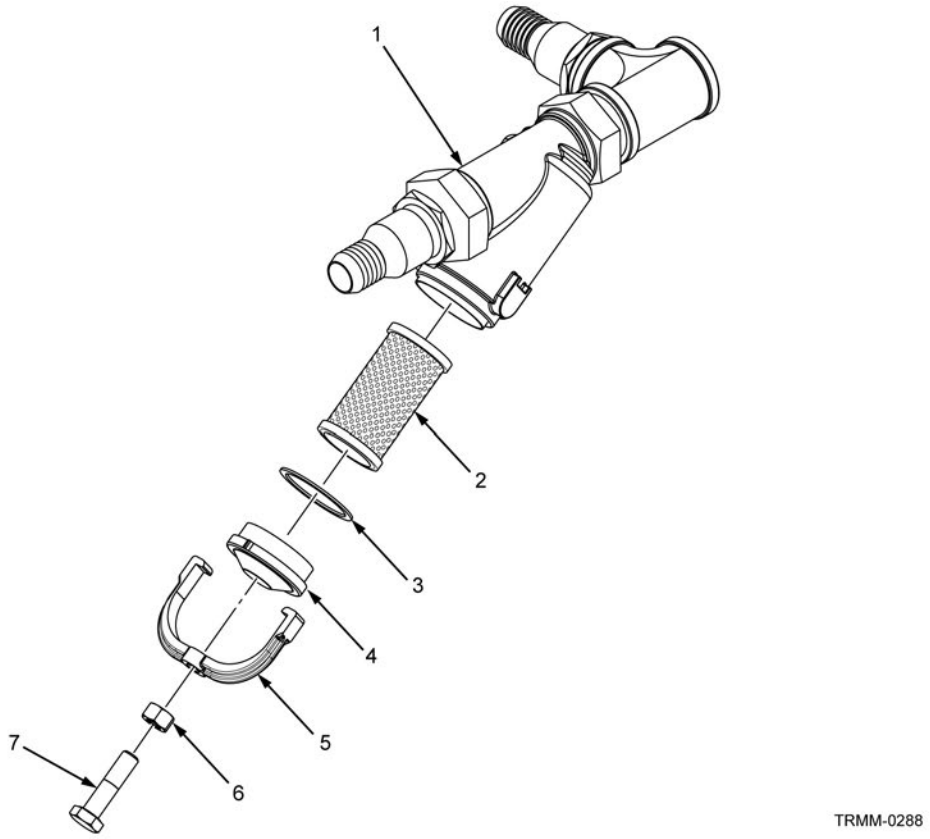


Figure 3. Strainer Basket Installation.

6. Dispose of residual fuel IAW unit SOP.
7. Install vapor recovery line dust cap (Figure 4, Item 1).

INSTALLATION - Continued

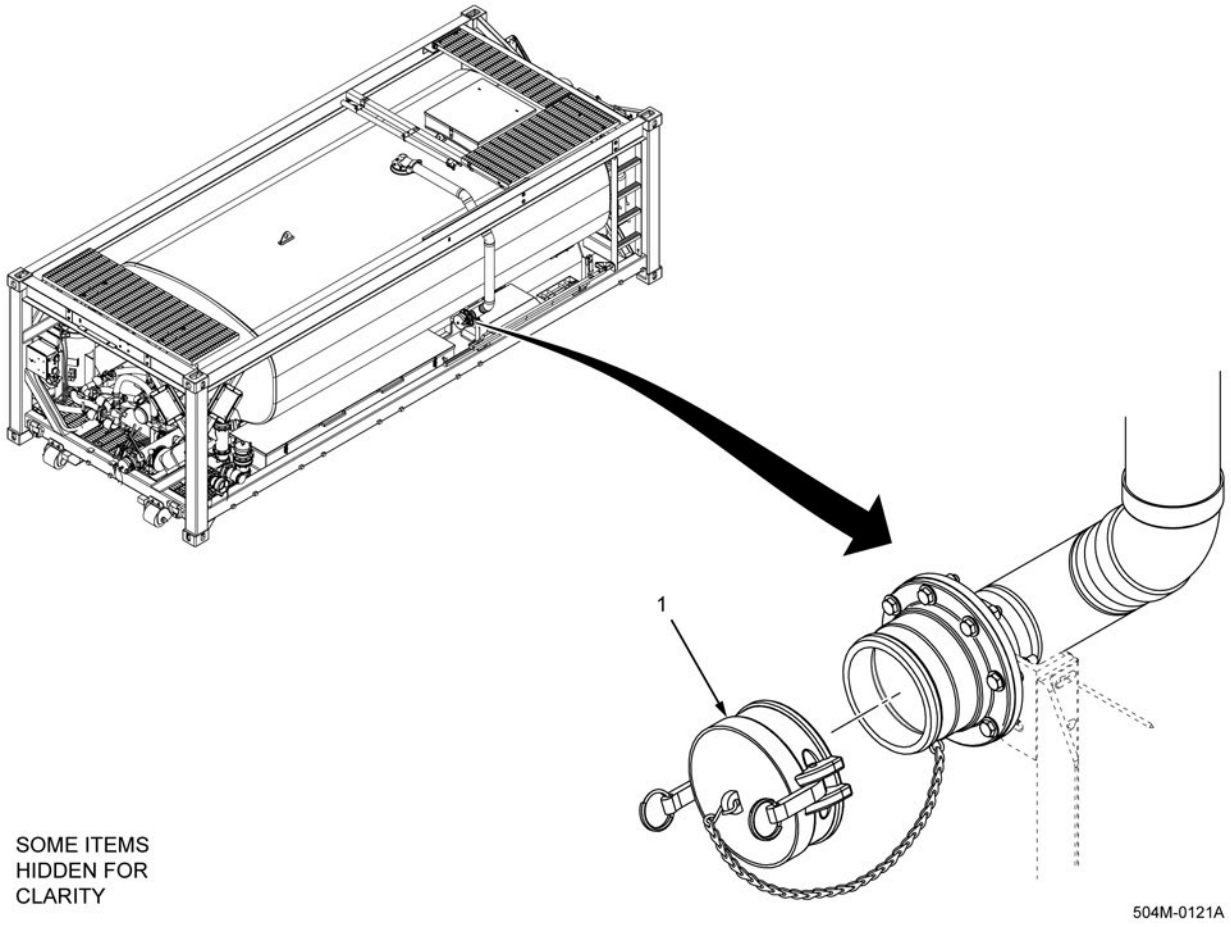


Figure 4. Installing Vapor Recovery Line Dust Cap.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Set up MFS TRM (TM 10-4930-371-10).
2. Check MFS TRM for leaks by recirculating fuel (TM 10-4930-371-10).

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
FLOW METER ASSEMBLY REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposable nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)
- Pan, drip (WP 0217, Table 1, Item 8)
- Vise, machinist's (WP 0217, Table 1, Item 14)
- Wire brush (WP 0217, Table 1, Item 15)
- Wrench, internal pipe (WP 0217, Table 1, Item 18)

Materials/Parts
- Absorbent material (WP 0216, Table 1, Item 1)
- Cleaning compound, solvent (WP 0216, Table 1, Item 3)
- Cloth, cleaning (WP 0216, Table 1, Item 4)
- Thread sealing compound (WP 0216, Table 1, Item 15)
- Gasket Qty: 2 (WP 0190, Figure 44, Item 15)
- Washer, Lock Qty: 4 (WP 0190, Figure 44, Item 18)
- Flow Meter Assembly (WP 0190, Figure 44, Item 20)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer (2)

References
- ATP 4-43
- TM 10-4930-371-10

Equipment Condition
- MFS TRM shut down (TM 10-4930-371-10)
- MFS TRM grounded (TM 10-4930-371-10)
- MFS TRM piping manifold evacuated (TM 10-4930-371-10)

Time to Complete
- 1.0 Hour(s)

REMOVAL

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Failure to comply could result in injury or death to personnel.

REMOVAL - Continued

1. Place drip pan under meter to catch residual fuel.
2. Remove four bolts (Figure 1, Item 7) and nuts (Figure 1, Item 6) and remove coupling halves (Figure 1, Item 1).
3. Push coupling gaskets (Figure 1, Item 8) onto pipe ends (Figure 1, Items 5 and 11).
4. Remove four bolts (Figure 1, Item 2) and lock washers (Figure 1, Item 3) and remove flow meter assembly (Figure 1, Item 10) from bracket (Figure 1, Item 4). Discard lock washers.
5. Remove nipples (Figure 1, Item 9) from flow meter assembly (Figure 1, Item 10)
6. Remove and discard coupling gaskets (Figure 1, Item 8).
7. Remove drip pan and dispose of fuel IAW unit SOP.

END OF TASK

CLEANING

WARNING

Solvent cleaning compound MIL-PRF-680 Type III is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Keep away from open flames and other sources of ignition. Failure to comply may cause injury to personnel.

1. Clean all metal parts with a cleaning cloth and solvent cleaning compound.
2. Clean threads of all disassembled components. Remove all buildup of dirt, oil, and debris from threads.
3. Allow parts to dry thoroughly.

END OF TASK

INSTALLATION

WARNING

Thread sealing compound is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Failure to comply may cause injury to personnel.

1. Apply thread sealing compound to all threads.
2. Install nipples (Figure 1, Item 9) on flow meter assembly (Figure 1, Item 10).
3. Lightly lubricate two new coupling gaskets (Figure 1, Item 8) with fuel.
4. Install coupling gaskets (Figure 1, Item 8) on pipe ends (Figure 1, Items 5 and 11). Ensure gaskets are flush with pipe ends.

INSTALLATION - Continued

NOTE

When installing meter assembly, flow indicator arrow on meter body must indicate flow from left to right.

5. Install flow meter assembly (Figure 1, Item 10) on bracket (Figure 1, Item 4) and secure with four bolts (Figure 1, Item 2) and new lock washers (Figure 1, Item 3).
6. Slide gaskets (Figure 1, Item 8) on meter assembly (Figure 1, Item 10) and center gasket over flow meter assembly nipples (Figure 1, Item 9) and pipe ends (Figure 1, Items 5 and 11).
7. Secure flow meter assembly nipples (Figure 1, Item 9) to pipe ends (Figure 1, Items 5 and 11) with coupling halves (Figure 1, Item 1), four bolts (Figure 1, Item 7), and nuts (Figure 1, Item 6).

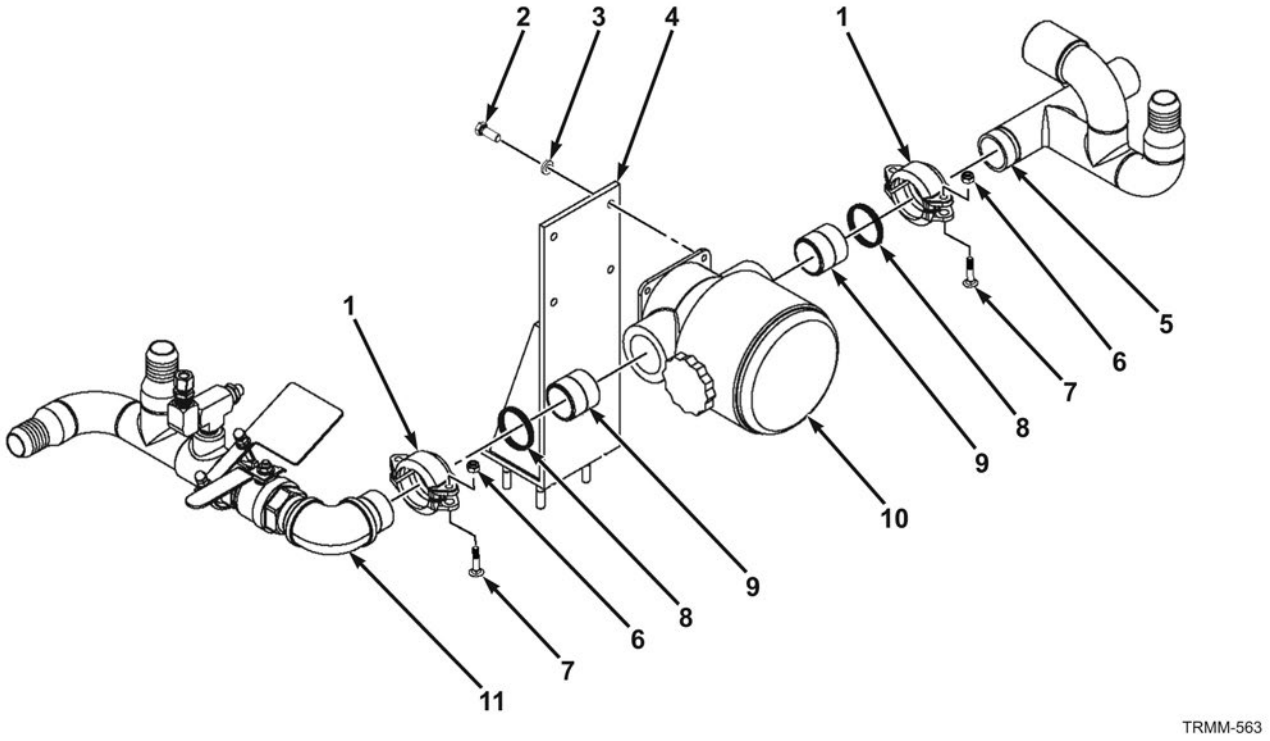


Figure 1. Flow Meter Assembly.

8. Remove drip pan and dispose of fuel IAW unit SOP.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Set up MFS TRM (TM 10-4930-371-10).

FOLLOW-ON MAINTENANCE - Continued

2. Check MFS TRM for leaks by recirculating fuel (TM 10-4930-371-10).

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
FLOW METER COMPONENTS REPAIR

INITIAL SETUP:

Tools and Special Tools
Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
Gloves, disposable nitrile (WP 0216, Table 1, Item 5)

Materials/Parts
Absorbent material (WP 0216, Table 1, Item 1)
Cleaning compound, solvent (WP 0216, Table 1, Item 3)
Cloth, cleaning (WP 0216, Table 1, Item 4)

Personnel Required
91J Quartermaster and Chemical Equipment Repairer

References
ATP 4-43

Equipment Condition
MFS TRM grounded (TM 10-4930-371-10)
MFS TRM shut down (TM 10-4930-371-10)

Time to Complete
0.2 Hour(s)

COVER REMOVAL

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Failure to comply could result in injury or death to personnel.

COVER REMOVAL - Continued

1. Remove two screws (Figure 1, Item 5) on cover (Figure 1, Item 4).
2. Remove cover (Figure 1, Item 4) and gasket (Figure 1, Item 3). Discard gasket.

END OF TASK

COVER INSTALLATION

1. Install new gasket (Figure 1, Item 3).
2. Install cover (Figure 1, Item 4) using two screws (Figure 1, Item 5).

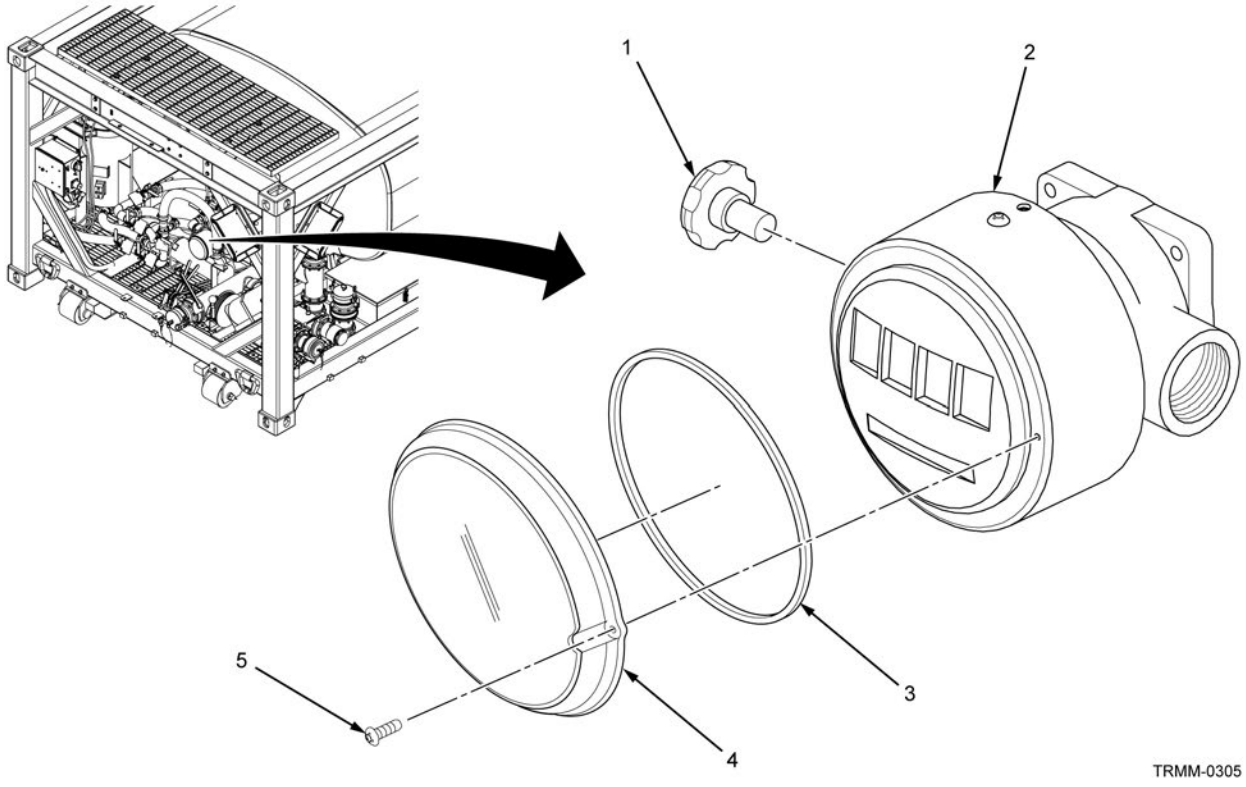


Figure 1. Flow Meter Assembly Removal.

END OF TASK

KNOB REMOVAL

Remove knob (Figure 1, Item 1) from flow meter (Figure 1, Item 2).

END OF TASK

KNOB INSTALLATION

Install knob (Figure 1, Item 1) on flow meter (Figure 1, Item 2).

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
FLOW METER PIPING REPAIR

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Gloves, disposable nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)
- Pan, drip (WP 0217, Table 1, Item 8)
- Vise, machinist's (WP 0217, Table 1, Item 14)
- Wrench, adjustable, automotive (WP 0217, Table 1, Item 17)
- Wrench, internal pipe (WP 0217, Table 1, Item 18)

Materials/Parts
- Absorbent material (WP 0216, Table 1, Item 1)
- Cleaning compound, solvent (WP 0216, Table 1, Item 3)
- Cloth, cleaning (WP 0216, Table 1, Item 4)
- Thread sealing compound (WP 0216, Table 1, Item 15)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer (2)

References
- ATP 4-43
- TM 10-4930-371-10
- WP 0089

Equipment Condition
- MFS TRM grounded (TM 10-4930-371-10)
- MFS TRM shut down (TM 10-4930-371-10)
- MFS TRM drained (TM 10-4930-371-10)
- MFS TRM loaded on PLS trailer (TM 10-4930-371-10)
- Ball valve placards removed (WP 0089)

Time to Complete
- 4 Hour(s)

INLET PIPING DISASSEMBLY

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Failure to comply could result in injury or death to personnel.

INLET PIPING DISASSEMBLY - Continued

NOTE

Note orientation of hardware and components to aid in installation.

1. Remove vapor recovery line dust cap (Figure 1, Item 2).
2. Momentarily open then close (V1) bottom loading valve (Figure 1, Item 1) to vent tank pressure.

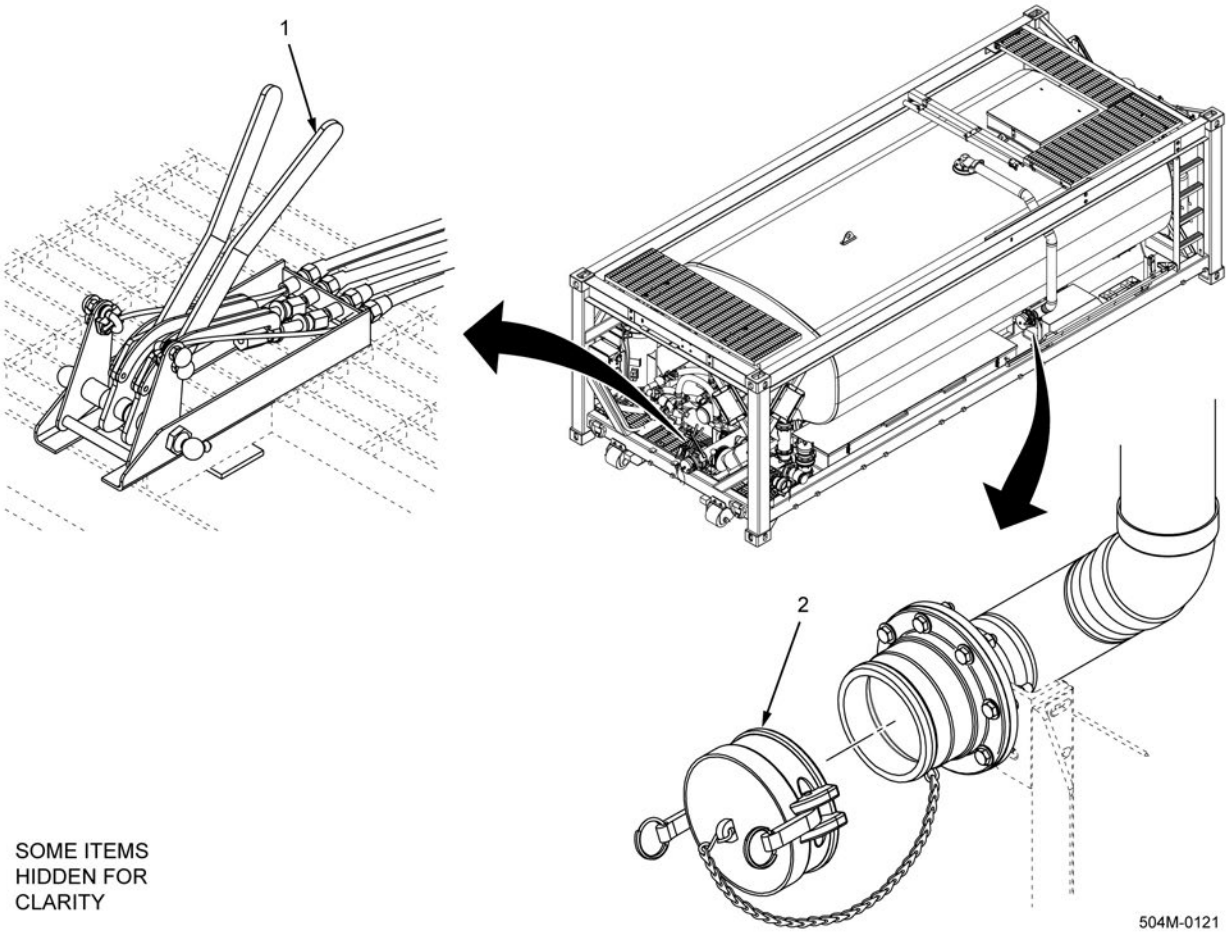


Figure 1. Fuel System Venting.

3. Place drip pan under inlet piping assembly.
4. Remove snap grip clip (Figure 2, Item 34) from flexible hose (Figure 2, Item 33).
5. Remove two hose clamps (Figure 2, Items 29 and 32) from flexible hoses (Figure 2, Items 28 and 33).
6. Disconnect flexible hoses (Figure 2, Items 28 and 33) from inlet piping (Figure 2, Item 21).
7. Disconnect two tube nuts (Figure 2, Items 10 and 36) with ferrules (Figure 2, Items 9 and 35) from elbows (Figure 2, Items 5 and 8).
8. Remove two locknuts (Figure 2, Item 30), two flat washers (Figure 2, Item 31), and a U-bolt (Figure 2, Item 22) from bracket (Figure 2, Item 27). Discard locknuts.

INLET PIPING DISASSEMBLY - Continued

9. Remove bolt (Figure 2, Item 23), two flat washers (Figure 2, Items 24 and 26), and locknut (Figure 2, Item 25) and remove bracket (Figure 2, Item 27). Discard locknut.
10. While supporting the inlet piping (Figure 2, Item 21), remove two nuts (Figure 2, Item 13), bolts (Figure 2, Item 16), and coupling halves (Figure 2, Item 14).
11. Place inlet piping (Figure 2, Item 21) in vise.
12. Remove and discard gasket (Figure 2, Item 15).
13. Remove elbow (Figure 2, Item 8) from tee (Figure 2, Item 6).
14. Remove bushing (Figure 2, Item 7) from tee (Figure 2, Item 6).
15. Remove elbow (Figure 2, Item 5) from tee (Figure 2, Item 6).
16. Remove tee (Figure 2, Item 6) from inlet piping (Figure 2, Item 21).
17. Remove nipple (Figure 2, Item 17) from elbow (Figure 2, Item 18).
18. While holding hexagon between ball valve (Figure 2, Item 19) and elbow (Figure 2, Item 18), remove elbow (Figure 2, Item 18) from ball valve (Figure 2, Item 19).
19. Remove ball valve (Figure 2, Item 19) using hexagon between inlet piping (Figure 2, Item 21) and ball valve (Figure 2, Item 19).
20. Remove nipple (Figure 2, Item 20) from inlet piping (Figure 2, Item 21).
21. Remove drip pan and dispose of fuel IAW unit SOP.

INLET PIPING DISASSEMBLY - Continued

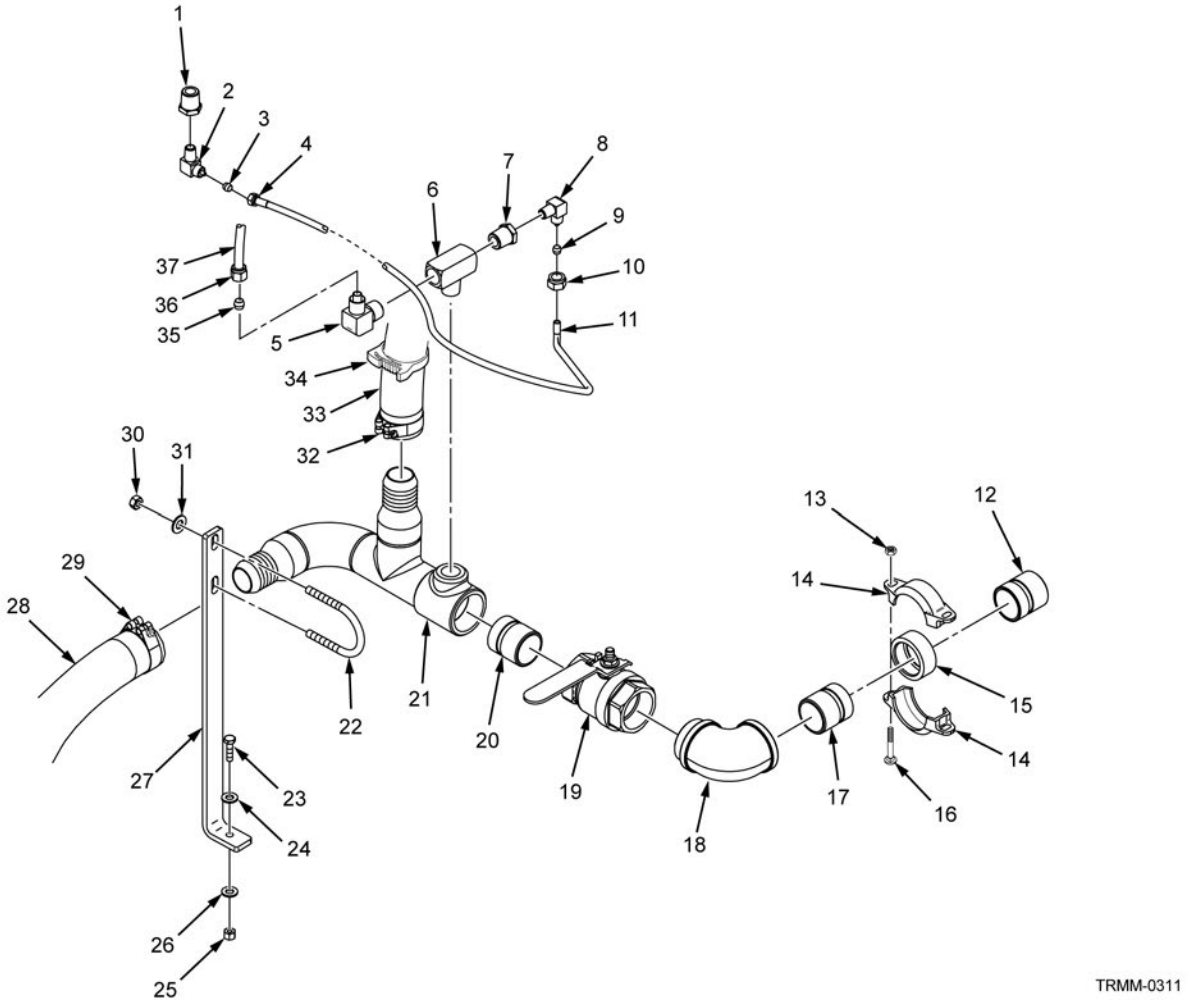


Figure 2. Flow Meter Assembly Inlet Piping.

END OF TASK

CLEANING

WARNING

Solvent cleaning compound MIL-PRF-680 Type III is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Keep away from open flames and other sources of ignition. Failure to comply may cause injury to personnel.

1. Remove all buildup of dirt, oil, and debris from threads.

CLEANING - Continued

2. Clean all metal parts with a cleaning cloth and solvent cleaning compound.
3. Allow parts to dry thoroughly.

END OF TASK

INLET PIPING ASSEMBLY

CAUTION

Once tightened, do not turn connections counterclockwise. Air leaks will be created and can cause leaks. Damage to equipment could occur.

1. Apply thread sealing compound to all threaded fittings except for product line connections on elbows.
2. Install tee (Figure 2, Item 6) on inlet piping (Figure 2, Item 21).
3. Install bushing (Figure 2, Item 7) on tee (Figure 2, Item 6).
4. Install elbow (Figure 2, Item 8) on bushing (Figure 2, Item 7).
5. Install elbow (Figure 2, Item 8) on tee (Figure 2, Item 6).
6. Loosely install nipple (Figure 2, Item 20) on inlet piping (Figure 2, Item 21).
7. Install ball valve (Figure 2, Item 19) on nipple (Figure 2, Item 20) and tighten using hexagon between inlet piping (Figure 2, Item 21) and ball valve (Figure 2, Item 19).
8. While holding hexagon between ball valve (Figure 2, Item 19) and elbow (Figure 2, Item 18), install elbow (Figure 2, Item 18) on ball valve (Figure 2, Item 19).
9. Install nipple (Figure 2, Item 17) on elbow (Figure 2, Item 18).
10. Lubricate new gasket (Figure 2, Item 15) with fuel.
11. Install gasket (Figure 2, Item 15) on nipple (Figure 2, Item 17).
12. While supporting inlet piping (Figure 2, Item 21), slide gasket onto nipple (Figure 2, Item 12) so that half remains on the inlet piping (Figure 2, Item 21).
13. Install two coupling halves (Figure 2, Item 14) using two bolts (Figure 2, Item 16) and nuts (Figure 2, Item 13).
14. Loosely install bracket (Figure 2, Item 27) using bolt (Figure 2, Item 23), two flat washers (Figure 2, Items 24 and 26), and new locknut (Figure 2, Item 25).
15. Install U-bolt (Figure 2, Item 22) with two flat washers (Figure 2, Item 31) and new locknuts (Figure 2, Item 30).
16. Tighten locknuts (Figure 2, Item 30) on bracket (Figure 2, Item 27).
17. Install two flexible hoses (Figure 2, Items 28 and 33) on inlet piping (Figure 2, Item 21).
18. Install two clamps (Figure 2, Items 29 and 32) on flexible hoses (Figure 2, Items 28 and 33).
19. Install two product lines (Figure 2, Items 11 and 37) using tube nuts (Figure 2, Items 10 and 36) and ferrules (Figure 2, Items 9 and 35) on elbows (Figure 2, Items 5 and 8).
20. Install snap grip clip (Figure 2, Item 34) on flexible hose (Figure 2, Item 33) and product line (Figure 2, Item 11).
21. Install vapor recovery line dust cap (Figure 3, Item 1).

INLET PIPING ASSEMBLY - Continued

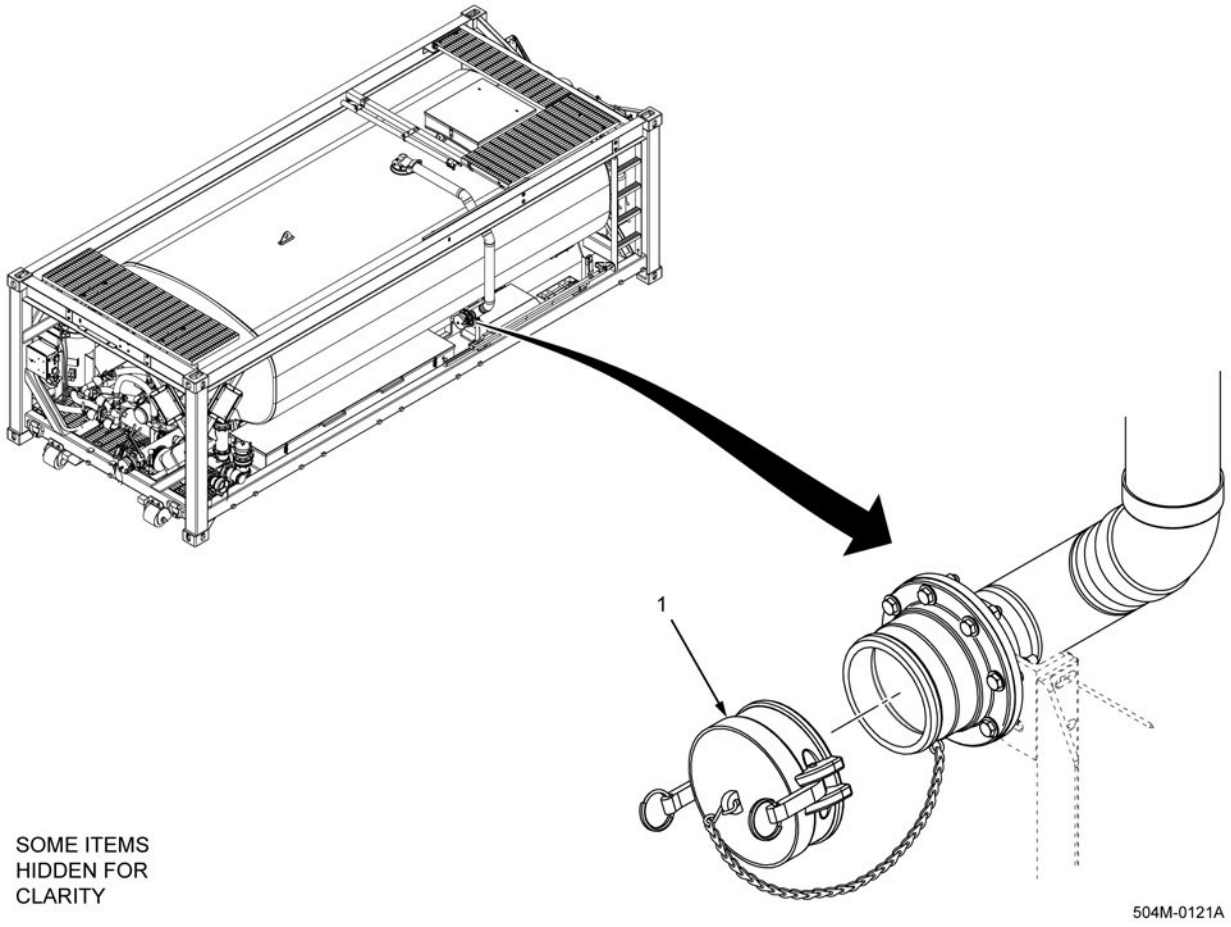


Figure 3. Installing Vapor Recovery Line Dust Cap.

END OF TASK

PRODUCT LINE DISASSEMBLY

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Failure to comply could result in injury or death to personnel.

NOTE

Note orientation of hardware and components to aid in installation.

1. Remove vapor recovery line dust cap (Figure 4, Item 2).
2. Momentarily open then close (V1) bottom loading valve (Figure 4, Item 1) to vent tank pressure.

PRODUCT LINE DISASSEMBLY - Continued

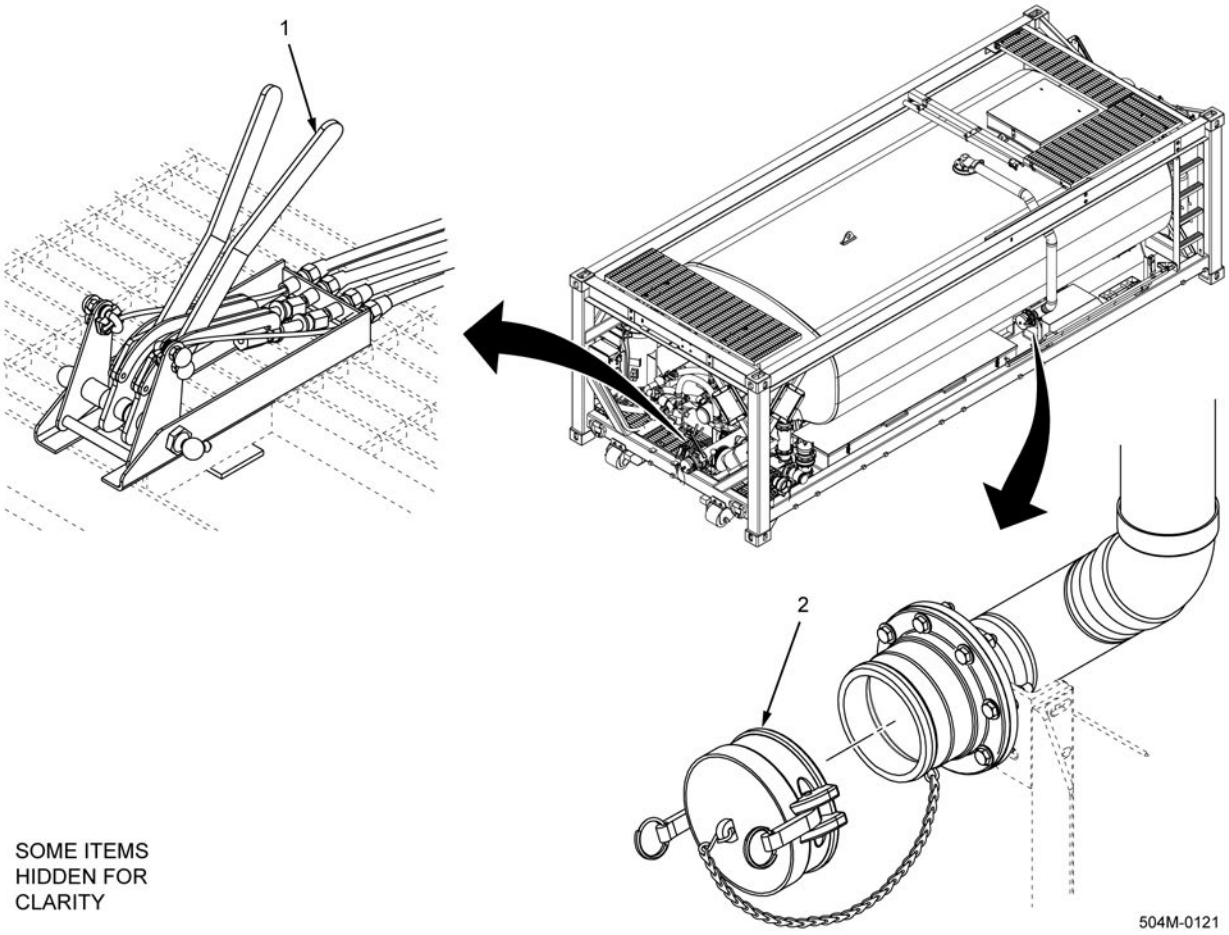


Figure 4. Fuel System Venting.

3. Place drip pan under product line ends.
4. Remove tube nut (Figure 5, Item 7) and ferrule (Figure 5, Item 6) from elbow (Figure 5, Item 5) on inlet piping (Figure 5, Item 9).
5. Remove tube nut (Figure 5, Item 4) and ferrule (Figure 5, Item 3) from elbow (Figure 5, Item 2).
6. Remove elbow (Figure 5, Item 2) from bushing (Figure 5, Item 1).
7. Remove bushing (Figure 5, Item 1) from tank.
8. Loosen four hose clamps.
9. Remove product line (Figure 5, Item 8).
10. Complete the cleaning subtask in this WP.
11. Remove drip pan and dispose of fuel IAW unit SOP.

PRODUCT LINE DISASSEMBLY - Continued

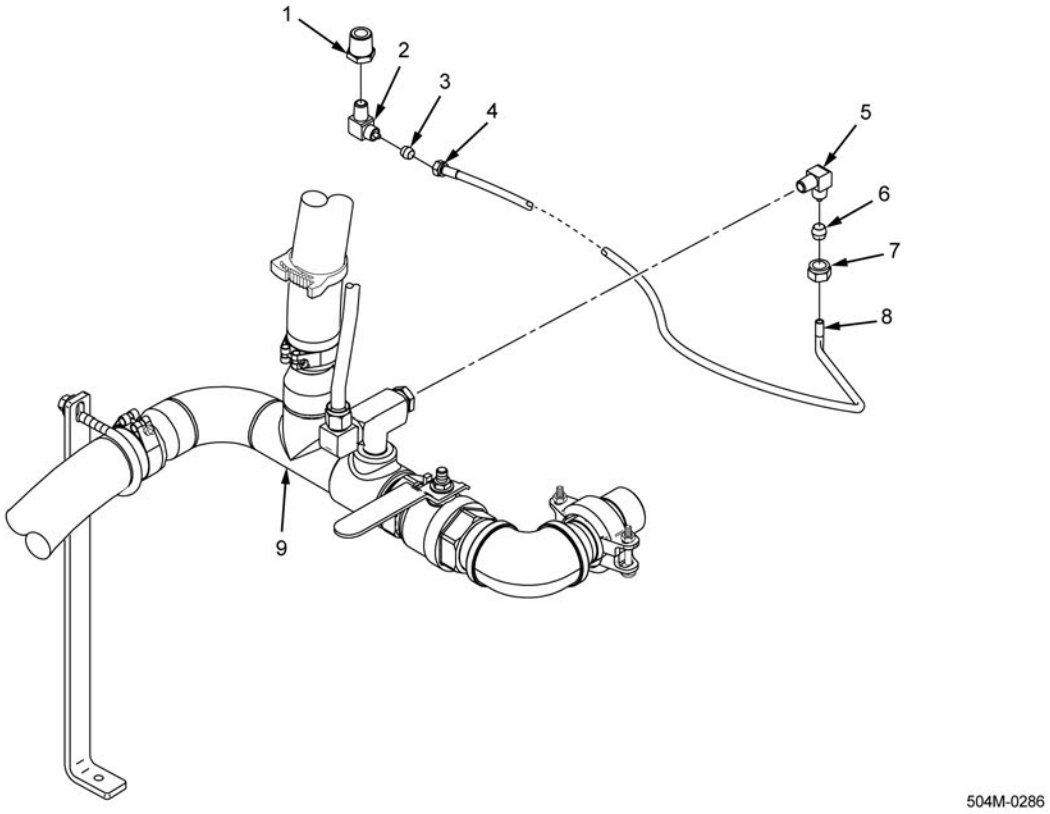


Figure 5. Product Line.

END OF TASK

PRODUCT LINE ASSEMBLY

1. Apply thread sealing compound to fittings in tank, bushing, and elbow except product line connections.
2. Install bushing (Figure 5, Item 1) into tank.
3. Install elbow (Figure 5, Item 2) on bushing (Figure 5, Item 1).
4. Route new product line (Figure 5, Item 8) through four hose clamps on bottom piping.
5. Install product line (Figure 5, Item 8) on tank using new tube nut (Figure 5, Item 4) and new ferrule (Figure 5, Item 3) on elbow (Figure 5, Item 2).

CAUTION

Do not overtighten cable clamps. Damage to equipment could occur.

6. Tighten four hose clamps.
7. Install product line (Figure 5, Item 8) on inlet piping (Figure 5, Item 9) using new tube nut (Figure 5, Item 7) and new ferrule (Figure 5, Item 6).
8. Install vapor recovery line dust cap (Figure 6, Item 1).

PRODUCT LINE ASSEMBLY - Continued

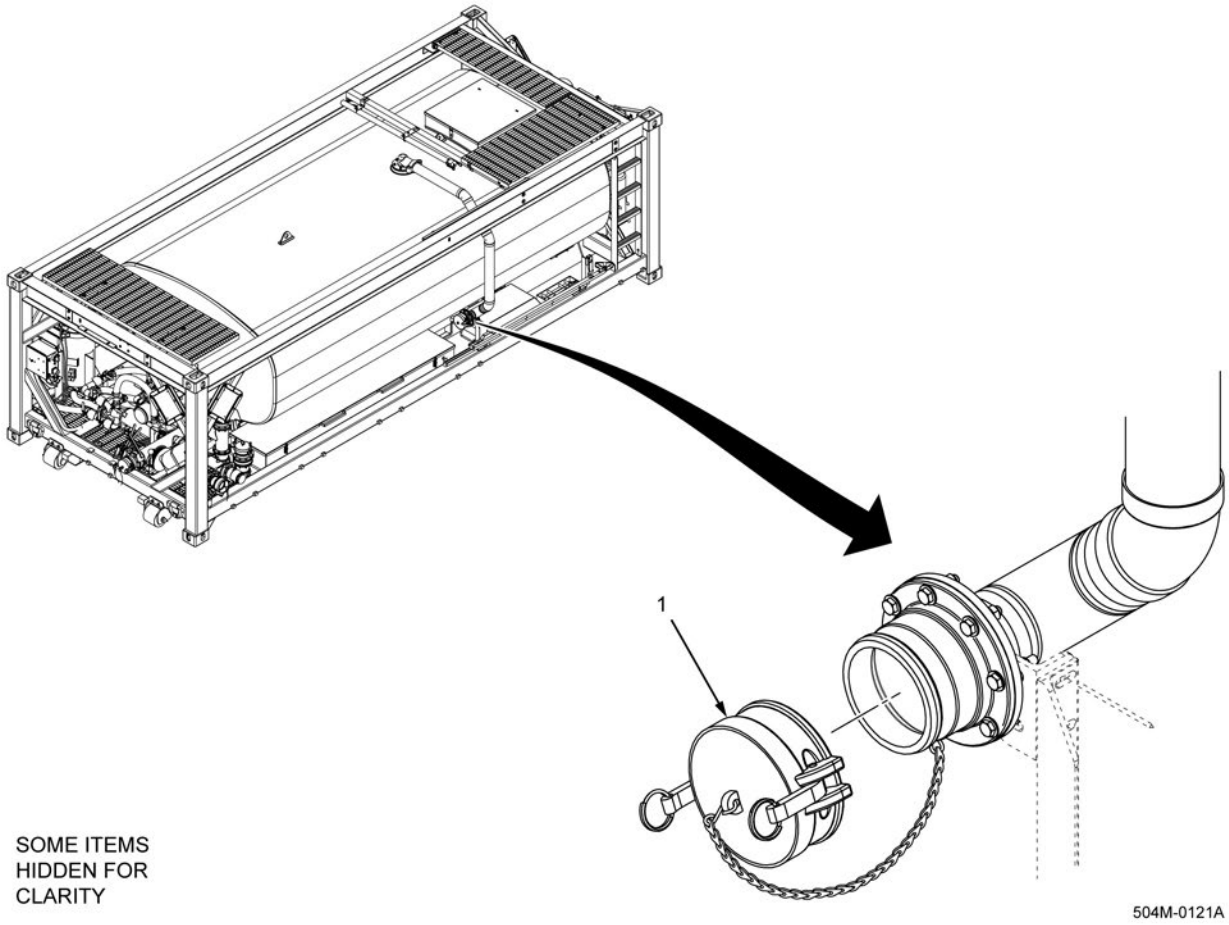


Figure 6. Installing Vapor Recovery Line Dust Cap.

END OF TASK

OUTLET PIPING DISASSEMBLY

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Failure to comply could result in injury or death to personnel.

NOTE

Note orientation of hardware and components to aid in installation.

1. Remove vapor recovery line dust cap (Figure 7, Item 2).
2. Momentarily open then close (V1) bottom loading valve (Figure 7, Item 1) to vent tank pressure.
3. Place drip pan under outlet piping assembly.

OUTLET PIPING DISASSEMBLY - Continued

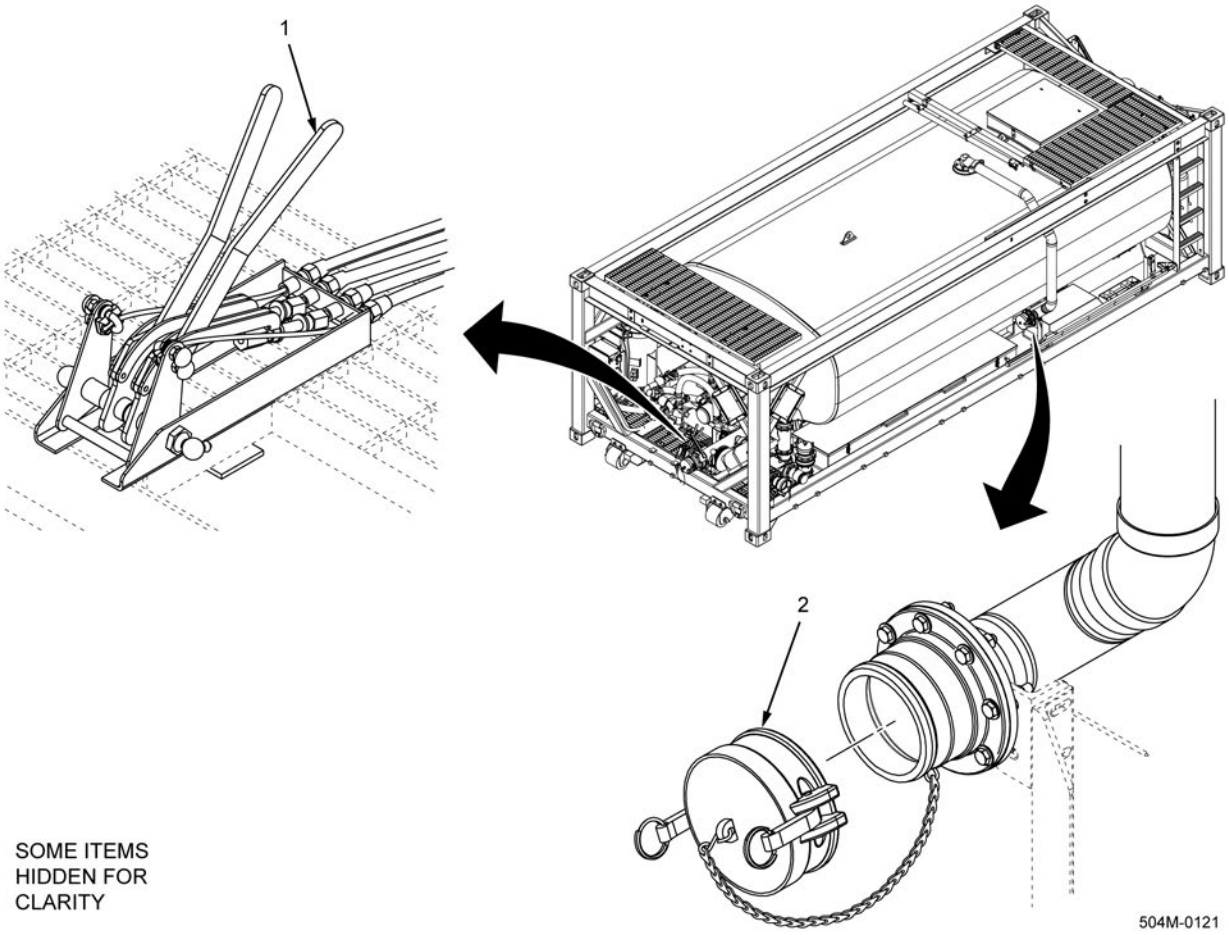


Figure 7. Fuel System Venting.

4. Remove four hose clamps (Figure 8, Item 5).
5. Disconnect four flexible hoses (Figure 8, Items 1, 6, 7, and 20).
6. Remove two locknuts (Figure 8, Item 11), flat washers (Figure 8, Item 10), and U-bolt (Figure 8, Item 4). Discard locknuts.
7. Remove locknut (Figure 8, Item 15), two flat washers (Figure 8, Item 13), grating clasp (Figure 8, Item 14), and bolt (Figure 8, Item 12) and remove bracket (Figure 8, Item 9). Discard locknut.
8. While supporting the outlet piping (Figure 8, Item 8), remove two nuts (Figure 8, Item 19), bolts (Figure 8, Item 17), and coupling halves (Figure 8, Item 16).
9. Place outlet piping (Figure 8, Item 8) in vise.
10. Remove and discard gasket (Figure 8, Item 18).
11. While holding hexagon between ball valve (Figure 8, Item 2) and hose barb, remove hose barb from ball valve (Figure 8, Item 2).
12. Place ball valve handle (Figure 8, Item 2) in open position.

OUTLET PIPING DISASSEMBLY - Continued

13. Remove ball valve (Figure 8, Item 2) from outlet piping (Figure 8, Item 8) using hexagon between ball valve (Figure 8, Item 2) and outlet piping (Figure 8, Item 8).
14. Remove nipple (Figure 8, Item 3).
15. Remove drip pan and dispose of fuel IAW unit SOP.

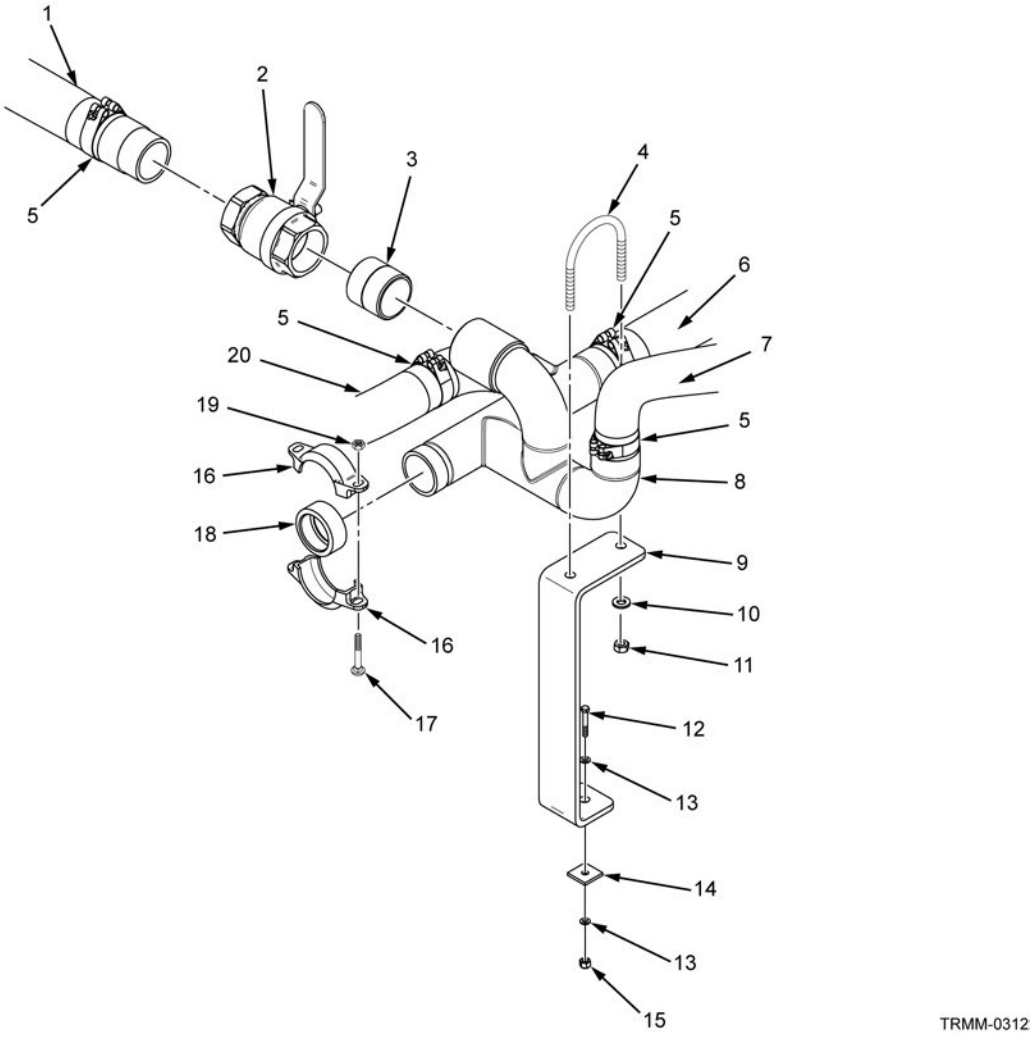


Figure 8. Flow Meter Outlet Piping.

END OF TASK

CLEANING

WARNING

Solvent cleaning compound MIL-PRF-680 Type III is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Keep away from open flames and other sources of ignition. Failure to comply may cause injury to personnel.

1. Remove all buildup of dirt, oil, and debris from threads.
2. Clean all metal parts with a cleaning cloth and solvent cleaning compound.
3. Allow parts to dry thoroughly.

END OF TASK

OUTLET PIPING ASSEMBLY

CAUTION

Once tightened, do not turn connections counterclockwise. Air leaks will be created and can cause leaks. Damage to equipment could occur.

1. Apply thread sealing compound on all threads.
2. Loosely install nipple (Figure 8, Item 3) on outlet piping (Figure 8, Item 8).
3. Install ball valve (Figure 8, Item 2) on nipple (Figure 8, Item 3) using hexagon between outlet piping (Figure 8, Item 8) and ball valve (Figure 8, Item 2). Close ball valve handle.
4. Install hose barb on ball valve (Figure 8, Item 2) using hexagon between hose barb and ball valve (Figure 8, Item 2) to tighten.
5. Lubricate new gasket (Figure 8, Item 18) with fuel.
6. Install gasket (Figure 8, Item 18) on outlet piping (Figure 8, Item 8).
7. While supporting outlet piping (Figure 8, Item 8), slide gasket (Figure 8, Item 18) onto nipple (Figure 8, Item 12) so that half remains on the outlet piping (Figure 8, Item 8).
8. Install coupling halves (Figure 8, Item 16) using two bolts (Figure 8, Item 17) and nuts (Figure 8, Item 19). Ensure coupling halves are touching.
9. Loosely install bracket (Figure 8, Item 9) using bolt (Figure 8, Item 12), two flat washers (Figure 8, Item 13), grating clasp (Figure 8, Item 14), and new locknut (Figure 8, Item 15).
10. Install U-bolt (Figure 8, Item 4) using two flat washers (Figure 8, Item 10) and new locknuts (Figure 8, Item 11).
11. Tighten locknut (Figure 8, Item 15) on bracket (Figure 8, Item 9).
12. Install four flexible hoses (Figure 8, Items 1, 6, 7, and 20) on hose barbs.
13. Install four hose clamps (Figure 8, Item 5).
14. Install vapor recovery line dust cap (Figure 9, Item 1).

OUTLET PIPING ASSEMBLY - Continued

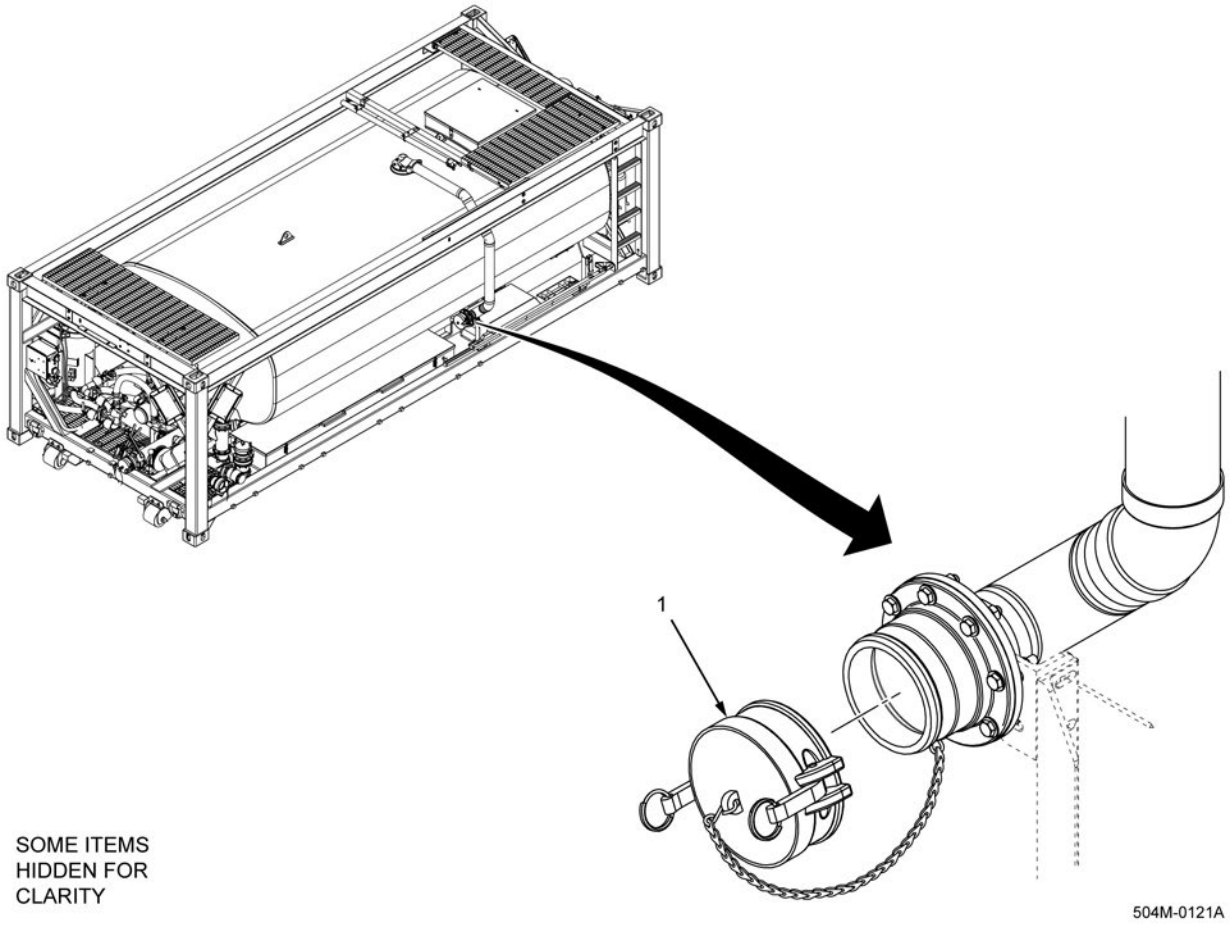


Figure 9. Installing Vapor Recovery Line Dust Cap.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install ball valve placard (WP 0089).
2. Set up MFS TRM (TM 10-4930-371-10).
3. Check MFS TRM for leaks by recirculating fuel (TM 10-4930-371-10).

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
METER INLET BALL VALVE (V13) REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposable nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)
- Pan, drip (WP 0217, Table 1, Item 8)
- Vise, machinist's (WP 0217, Table 1, Item 14)
- Wire brush (WP 0217, Table 1, Item 15)
- Wrench, adjustable, automotive (WP 0217, Table 1, Item 17)
- Wrench, internal pipe (WP 0217, Table 1, Item 18)
- Wrench, pipe, 18 inch (WP 0217, Table 1, Item 19)

Materials/Parts
- Absorbent material (WP 0216, Table 1, Item 1)
- Cleaning compound, solvent (WP 0216, Table 1, Item 3)
- Cloth, cleaning (WP 0216, Table 1, Item 4)
- Thread sealing compound (WP 0216, Table 1, Item 15)

Materials/Parts (cont.)
- Gasket (WP 0190, Figure 44, Item 15)
- Nut, self-locking, hexagon (LOCKNUTS) Qty: 2 (WP 0190, Figure 44, Item 9)
- Ball valve (WP 0190, Figure 44, Item 3)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer

References
- ATP 4-43
- TM 10-4930-371-10
- WP 0089

Equipment Condition
- MFS TRM grounded (TM 10-4930-371-10)
- Piping manifold evacuated (TM 10-4930-371-10)
- (V13) placard mount removed (WP 0089)

Time to Complete
- 1.5 Hour(s)

REMOVAL

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Use a drip pan to collect leaking fuel. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.

REMOVAL - Continued

NOTE

Due to the characteristics of brass and aluminum threaded piping connections and the force required to assemble and disassembled these threaded connections, it is preferred to remove complete piping assemblies intact and secure them to a rigid work platform before attempting to assemble or disassemble individual fittings.

NOTE

Note orientation of hardware and components to aid in installation.

1. Place drip pan under valve to catch residual fuel.
2. Unscrew tube nut (Figure 1, Item 2) with ferrule (Figure 1, Item 1) and disconnect hose (Figure 1, Item 3).
3. Unscrew tube nut (Figure 1, Item 5) with ferrule (Figure 1, Item 4) and disconnect hose (Figure 1, Item 6).

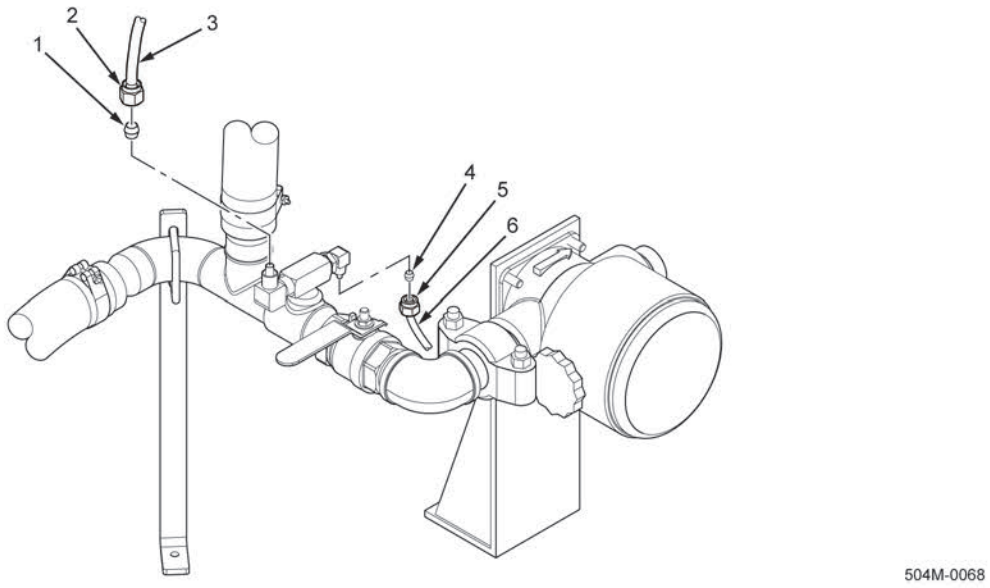


Figure 1. Removing Air Bleed Lines.

4. Remove hose clamp (Figure 2, Item 2). Remove hose (Figure 2, Item 1) from pipe nipple.
5. Remove hose clamp (Figure 2, Item 2). Remove hose (Figure 2, Item 4) from pipe nipple.
6. Remove two nuts (Figure 2, Item 8) and two bolts (Figure 2, Item 11) and remove coupling halves (Figure 2, Item 7).
7. Slide coupling gasket (Figure 2, Item 9) onto flow meter assembly nipple (Figure 2, Item 10).
8. Support pipe assembly and remove two locknuts (Figure 2, Item 5) and flat washers (Figure 2, Item 4). Remove U-bolt (Figure 2, Item 13) from pipe support bracket (Figure 2, Item 3). Discard locknuts.
9. Remove pipe assembly (Figure 2, Item 12) and discard coupling gasket (Figure 2, Item 9).
10. Place pipe assembly (Figure 2, Item 12) in vise.

REMOVAL - Continued

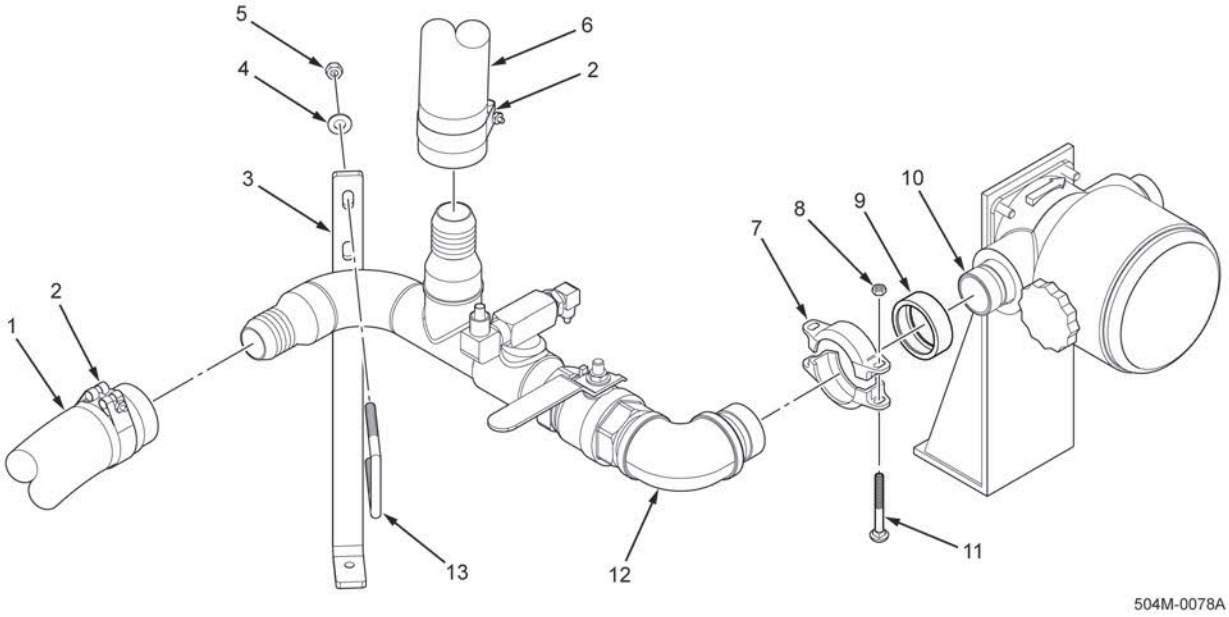


Figure 2. Removing Pipe Assembly.

REMOVAL - Continued

11. At the hexagon between the meter inlet ball valve (V13) (Figure 3, Item 3) and pipe assembly (Figure 3, Item 1), remove the meter inlet ball valve (V13) (Figure 3, Item 3) and elbow (Figure 3, Item 2) from pipe assembly (Figure 3, Item 1).
12. At the hexagon between the meter inlet ball valve (V13) (Figure 3, Item 3) and elbow (Figure 3, Item 2), remove the elbow (Figure 3, Item 2) from the meter inlet ball valve (V13) (Figure 3, Item 3).
13. If nipple (Figure 3, Item 4) is removed with meter inlet ball valve (V13) (Figure 3, Item 3), remove nipple (Figure 3, Item 4) from meter inlet ball valve (V13) (Figure 3, Item 3).
14. Remove drip pan and dispose of fuel IAW unit SOP.

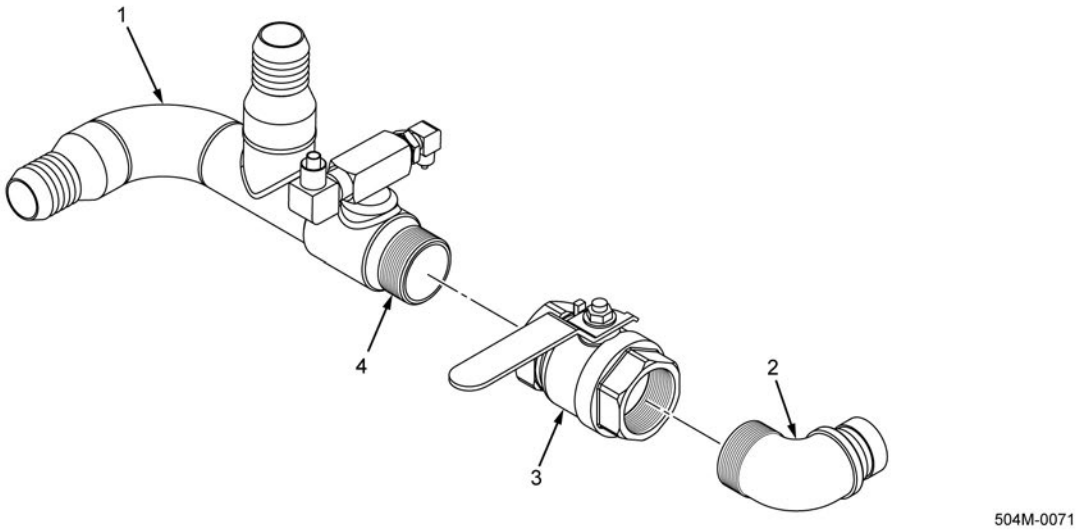


Figure 3. Removing Meter Inlet Ball Valve (V13).

END OF TASK

CLEANING

WARNING

Solvent cleaning compound MIL-PRF-680 Type III is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Keep away from open flames and other sources of ignition. Failure to comply may cause injury to personnel.

1. Clean threads of all disassembled components. Remove all buildup of dirt, oil, and debris from threads.
2. Clean all metal parts with a cleaning cloth and solvent cleaning compound.

CLEANING - Continued

3. Allow parts to dry thoroughly.

END OF TASK

INSTALLATION

WARNING

Thread sealing compound is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Failure to comply may cause injury to personnel.

CAUTION

Once tightened, do not turn connections counterclockwise. Air leaks will be created and can cause leaks. Damage to equipment could occur.

1. Apply thread sealing compound to all threads of all fittings.
2. Install elbow (Figure 4, Item 2) on new meter inlet ball valve (V13) (Figure 4, Item 3). Tighten the meter inlet ball valve (V13) (Figure 4, Item 3) using the hexagon between the meter inlet ball valve (V13) (Figure 4, Item 3) and elbow (Figure 4, Item 2).
3. If necessary, install nipple (Figure 4, Item 4) into pipe assembly (Figure 4, Item 1). Do not fully tighten.
4. Install the meter inlet ball valve (V13) (Figure 4, Item 3) on the nipple (Figure 4, Item 4). Tighten the meter inlet ball valve (V13) (Figure 4, Item 3) and nipple (Figure 4, Item 4) at the hexagon between the meter inlet ball valve (V13) (Figure 4, Item 3) and pipe assembly (Figure 4, Item 1).

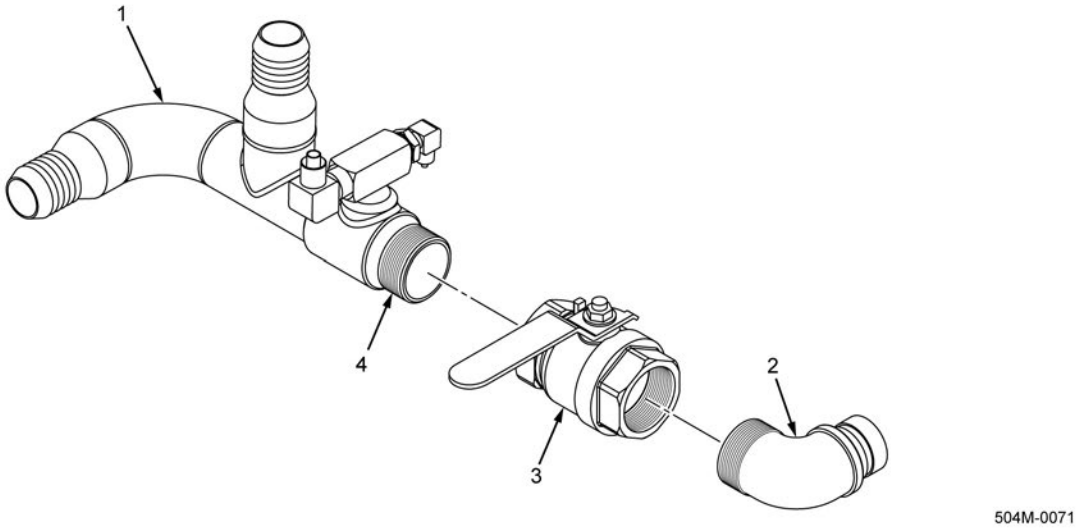


Figure 4. Installing Meter Inlet Ball Valve (V13).

INSTALLATION - Continued

5. Lightly lubricate new coupling gasket (Figure 5, Item 9) with fuel and install onto pipe assembly (Figure 5, Item 13).
6. Center coupling gasket (Figure 5, Item 9) between flow meter assembly nipple (Figure 5, Item 10) and nipple (Figure 5, Item 12).
7. Install coupling halves (Figure 5, Item 7) and secure with two bolts (Figure 5, Item 11) and two nuts (Figure 5, Item 8). Ensure coupling halves (Figure 5, Item 7) are touching.
8. Install support bracket (Figure 5, Item 3), U-bolt (Figure 5, Item 14), two flat washers (Figure 5, Item 4) and two new locknuts (Figure 5, Item 5).
9. Install hose (Figure 5, Item 6) onto nipple and install hose clamp (Figure 5, Item 2).
10. Install hose (Figure 5, Item 1) onto nipple and install hose clamp (Figure 5, Item 2).

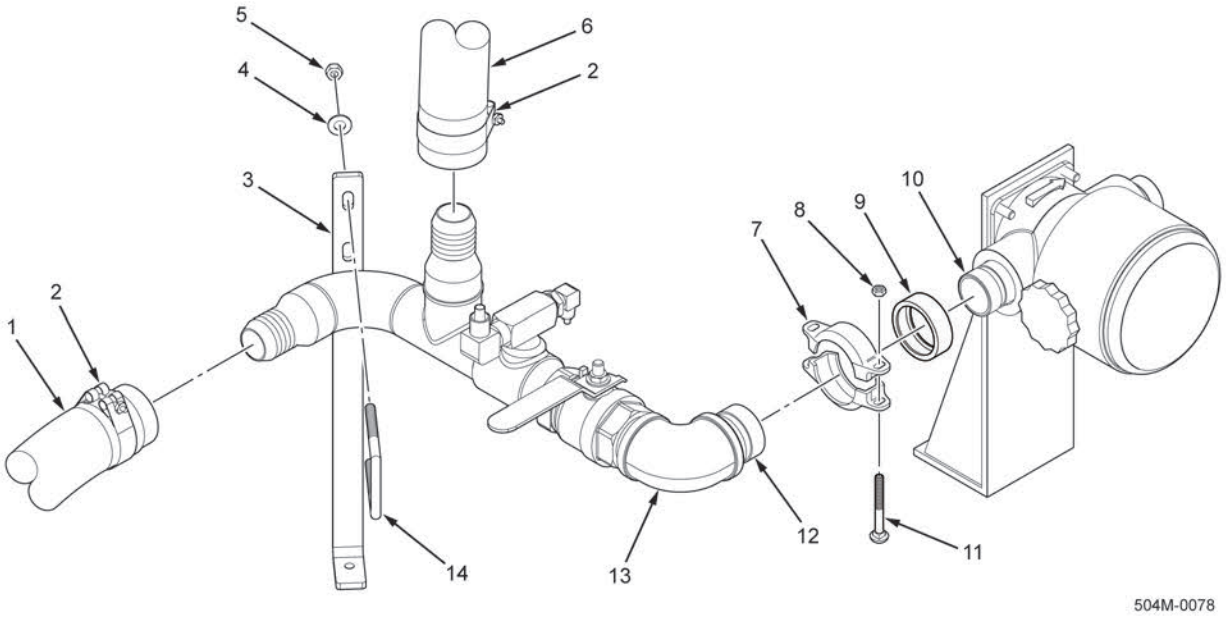


Figure 5. Installing Pipe Assembly.

11. Install tube (Figure 6, Item 6) onto elbow fitting and secure with tube nut (Figure 6, Item 5) and ferrule (Figure 6, Item 4).
12. Install tube (Figure 6, Item 3) onto elbow fitting and secure with tube nut (Figure 6, Item 2) and ferrule (Figure 6, Item 1).

INSTALLATION - Continued

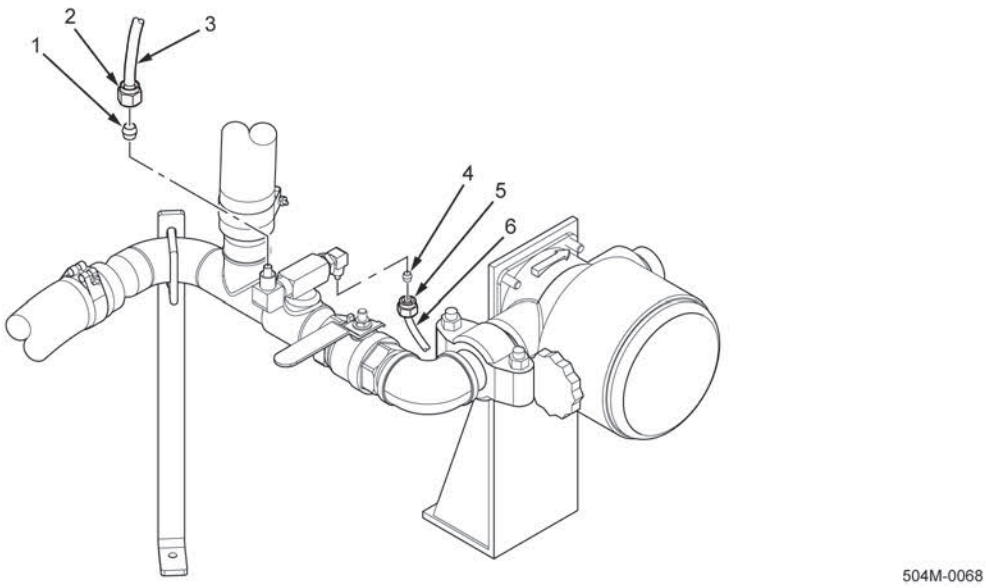


Figure 6. Installing Air Bleed Lines.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install (V13) ball valve placard (WP 0089).
2. Set up MFS TRM (TM 10-4930-371-10).
3. Check MFS TRM for leaks by recirculating fuel (TM 10-4930-371-10).

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
METER OUTLET BALL VALVE (V14) REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposable nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)
- Pan, drip (WP 0217, Table 1, Item 8)
- Vise, machinist's (WP 0217, Table 1, Item 14)
- Wire brush (WP 0217, Table 1, Item 15)
- Wrench, adjustable, automotive (WP 0217, Table 1, Item 17)
- Wrench, internal pipe (WP 0217, Table 1, Item 18)

Materials/Parts
- Absorbent material (WP 0216, Table 1, Item 1)
- Cloth, cleaning (WP 0216, Table 1, Item 4)
- Cleaning compound, solvent (WP 0216, Table 1, Item 3)
- Thread sealing compound (WP 0216, Table 1, Item 15)
- Ball valve (WP 0190, Figure 44, Item 3)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer

References
- ATP 4-43
- TM 10-4930-371-10
- WP 0144.5

Equipment Condition
- MFS TRM grounded (TM 10-4930-371-10)
- MFS TRM piping manifold evacuated (TM 10-4930-371-10)
- (V14) placard mount removed (WP 0089)

Time to Complete
- 1.5 Hour(s)

REMOVAL

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Failure to comply could result in injury or death to personnel.

REMOVAL - Continued

NOTE

- For TRM with ADR, refer to (WP 0144.5).
- Note orientation of hardware and components to aid in installation.

1. Remove vapor recovery line dust cap (Figure 1, Item 2).
2. Momentarily open then close bottom loading valve (V1) (Figure 1, Item 1) to vent tank pressure.

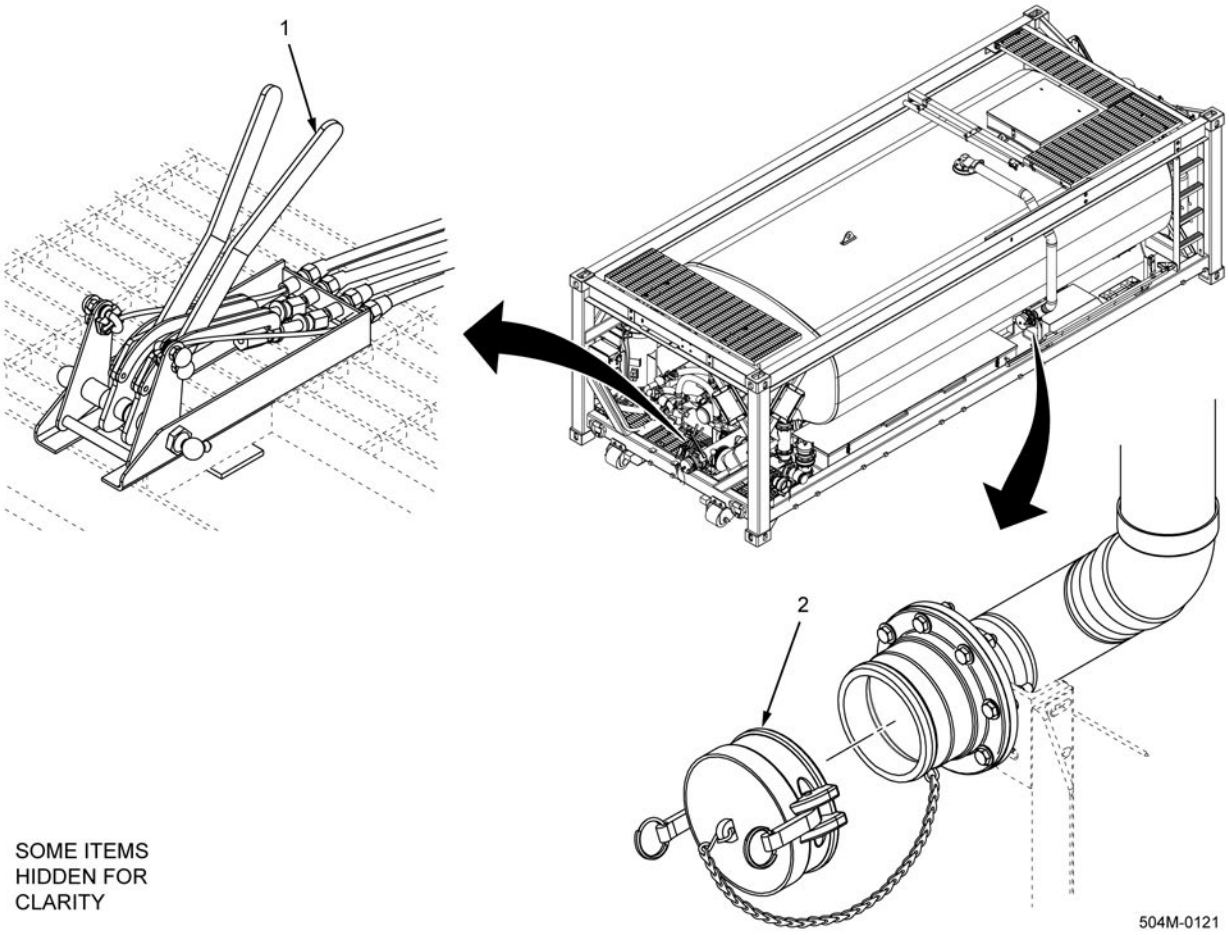


Figure 1. Fuel System Venting.

3. Place drip pan under valve to catch residual fuel.
4. Remove clamp (Figure 2, Item 5) and flexible hose (Figure 2, Item 4).
5. Place ball valve handle (Figure 2, Item 6) into the open position.
6. At the hexagon between the meter outlet ball valve (V14) (Figure 2, Item 2) and pipe assembly (Figure 2, Item 1), remove the hose barb (Figure 2, Item 3) and meter outlet ball valve (V14) (Figure 2, Item 2) from pipe assembly (Figure 2, Item 1).
7. Place the meter outlet ball valve (V14) (Figure 2, Item 2) and the hose barb (Figure 2, Item 3) in vise.
8. At the hexagon between the meter outlet ball valve (V14) (Figure 2, Item 2) and hose barb (Figure 2, Item 3), remove the meter outlet ball valve (V14) (Figure 2, Item 2) from the hose barb (Figure 2, Item 3).

REMOVAL - Continued

9. If nipple (Figure 2, Item 7) was removed with meter outlet ball valve (V14) (Figure 2, Item 2), remove nipple (Figure 2, Item 7) from meter outlet ball valve (V14) (Figure 2, Item 2) and retain for installation.

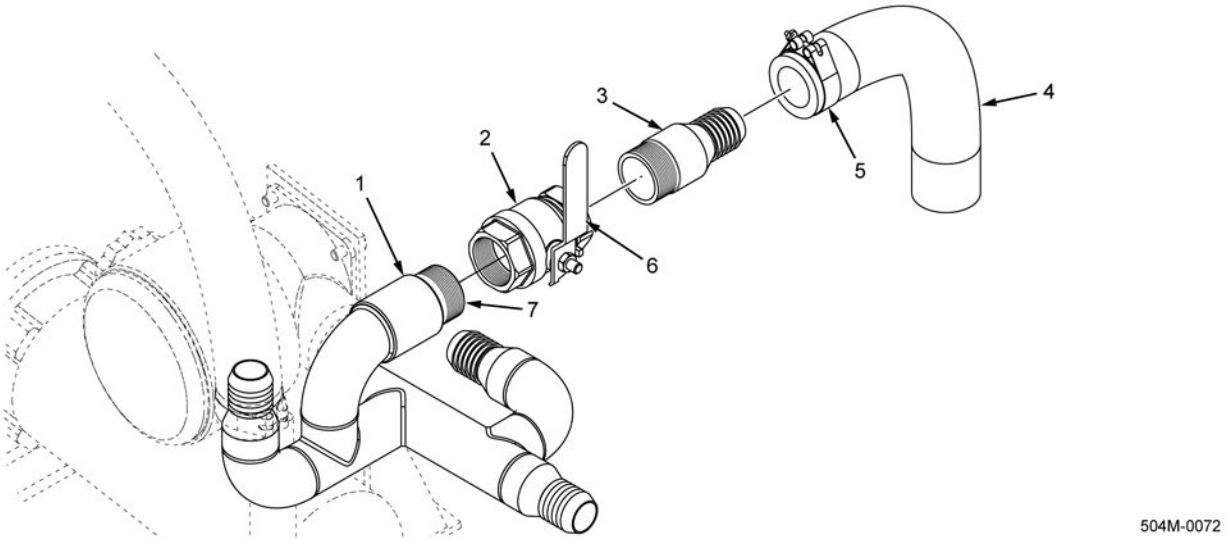


Figure 2. Removing Meter Outlet Ball Valve (V14).

10. Remove drip pan and dispose of fuel IAW unit SOP.

END OF TASK

CLEANING

WARNING

Solvent cleaning compound MIL-PRF-680 Type III is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Keep away from open flames and other sources of ignition. Failure to comply may cause injury to personnel.

1. Clean all metal parts with a cleaning cloth and solvent cleaning compound.
2. Clean threads of all disassembled components. Remove all buildup of dirt, oil, and debris from threads.
3. Allow parts to dry thoroughly.

END OF TASK

INSTALLATION

WARNING

Thread sealing compound is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Failure to comply may cause injury to personnel.

CAUTION

Once tightened, do not turn connections counterclockwise. Air leaks will be created and can cause leaks. Damage to equipment could occur.

1. Apply thread sealing compound to all threads.
2. Install hose barb (Figure 2, Item 3) on meter outlet ball valve (V14) (Figure 2, Item 2). Tighten the meter outlet ball valve (V14) (Figure 2, Item 2) using the hexagon between the meter outlet ball valve (V14) (Figure 2, Item 2) and hose barb (Figure 2, Item 3).
3. If nipple (Figure 2, Item 7) was removed, reinstall in pipe assembly (Figure 2, Item 1). Do not fully tighten.
4. Install meter outlet ball valve (V14) (Figure 2, Item 2) on nipple (Figure 2, Item 7). Tighten the meter outlet ball valve (V14) (Figure 2, Item 2) and nipple (Figure 2, Item 7) using the hexagon between the meter outlet ball valve (V14) (Figure 2, Item 2) and pipe assembly (Figure 2, Item 1).
5. Place ball valve handle (Figure 2, Item 6) into closed position.
6. Install flexible hose (Figure 2, Item 4) and clamp (Figure 2, Item 5) onto hose barb (Figure 2, Item 3).
7. Install vapor recovery line dust cap (Figure 3, Item 1).

INSTALLATION - Continued

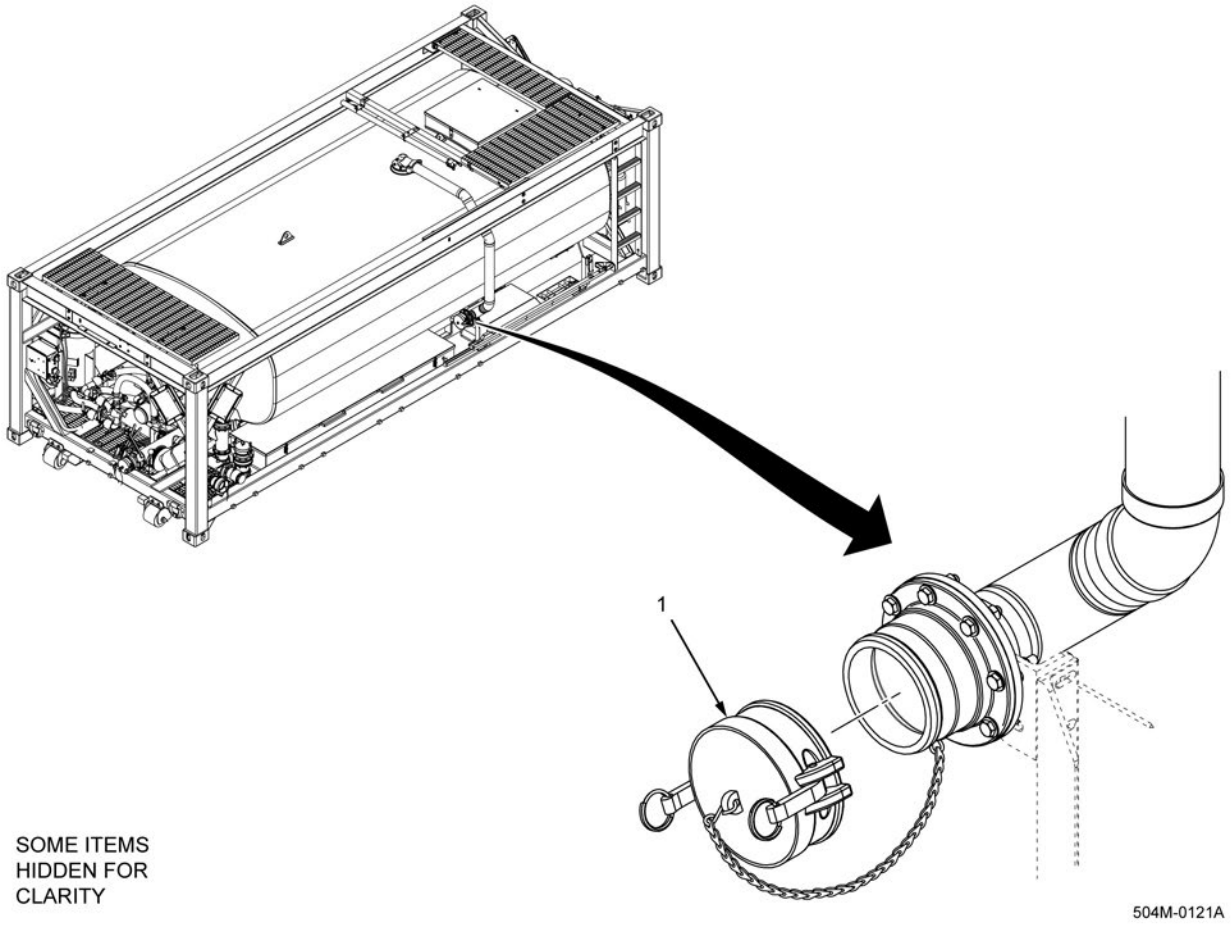


Figure 3. Installing Vapor Recovery Line Dust Cap.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install (V14) ball valve placard (WP 0089).
2. Set up MFS TRM (TM 10-4930-371-10).
3. Check MFS TRM for leaks by recirculating fuel (TM 10-4930-371-10).

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
VACUUM BREAKER (VB1) REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposable nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)
- Pan, drip (WP 0217, Table 1, Item 8)
- Vise, machinist's (WP 0217, Table 1, Item 14)

Materials/Parts
- Absorbent material (WP 0216, Table 1, Item 1)
- Cleaning compound, solvent (WP 0216, Table 1, Item 3)
- Cloth, cleaning (WP 0216, Table 1, Item 4)
- Thread sealing compound (WP 0216, Table 1, Item 15)
- Ball valve (WP 0191, Figure 45, Item 6)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer

References
- ATP 4-43
- WP 0144.3

Equipment Condition
- MFS TRM grounded (TM 10-4930-371-10)
- MFS TRM shut down (TM 10-4930-371-10)

Time to Complete
- 0.5 Hour(s)

REMOVAL

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Use a drip pan to collect leaking fuel. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.

REMOVAL - Continued

1. Remove vapor recovery line dust cap (Figure 1, Item 2).
2. Momentarily open then close bottom loading valve (V1) (Figure 1, Item 1) to vent tank pressure.

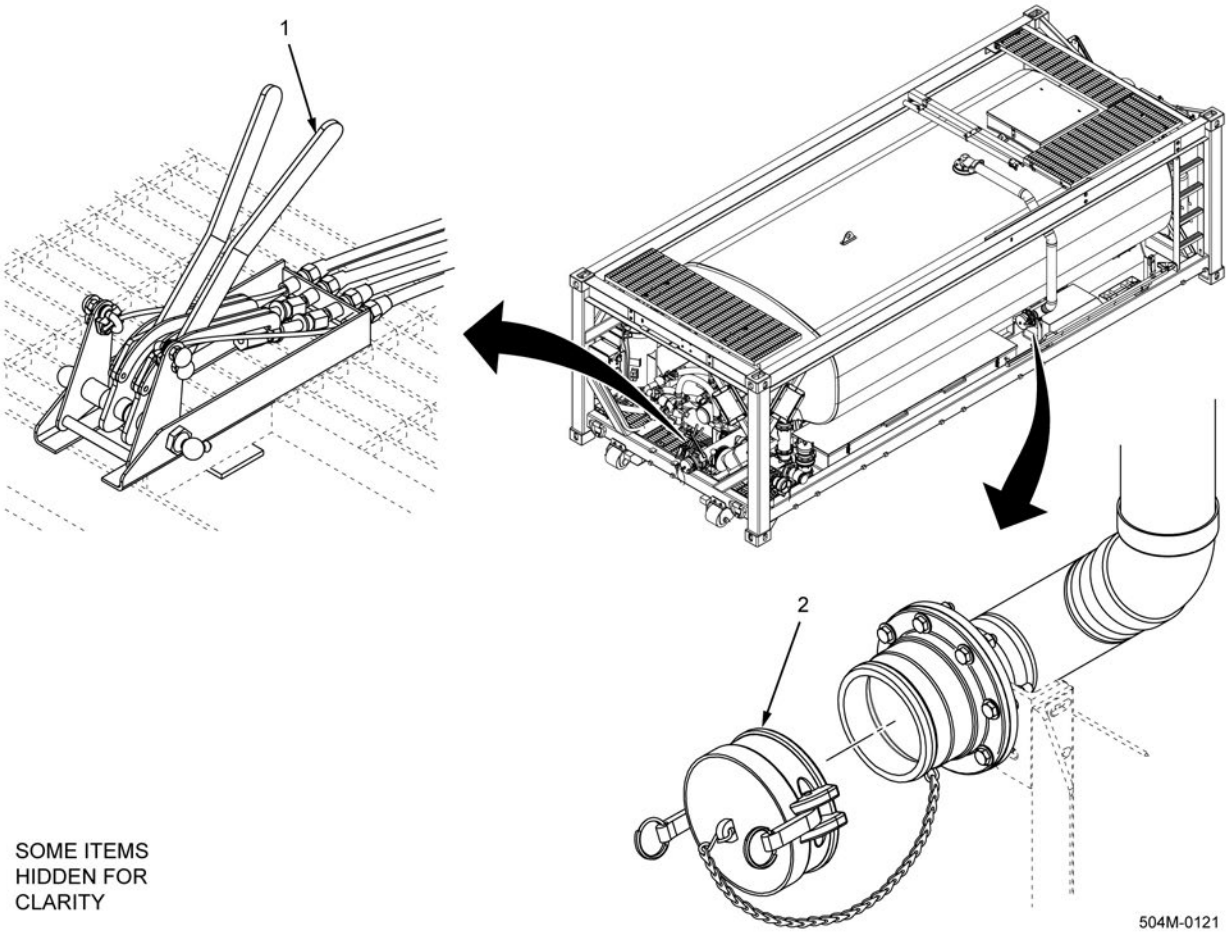


Figure 1. Fuel System Venting.

3. Place drip pan under valve to catch residual fuel.

NOTE

- Perform Step 4 if replacing vacuum breaker (VB1) on TRM with ADR.
- Perform Step 5 for TRM without ADR.

4. Remove vacuum breaker check valve (V23) (WP 0144.3).
5. Unscrew tube nut (Figure 2, Item 2) and disconnect tube (Figure 2, Item 1). If damaged, remove tube nut (Figure 2, Item 2) and ferrule (Figure 2, Item 3) from tube (Figure 2, Item 1). Discard tube nut and ferrule.
6. Remove elbow (Figure 2, Item 4), vacuum breaker (VB1) (Figure 2, Item 5), nipple (Figure 2, Item 7), and elbow (Figure 2, Item 6) from pipe (Figure 2, Item 8).
7. Remove elbow (Figure 2, Item 6) with nipple (Figure 2, Item 7) from vacuum breaker (VB1) (Figure 2, Item 5).

REMOVAL - Continued

8. Remove elbow (Figure 2, Item 6) from nipple (Figure 2, Item 7).
9. Remove elbow (Figure 2, Item 4) from vacuum breaker (VB1) (Figure 2, Item 5).
10. Remove drip pan and dispose of fuel IAW unit SOP.

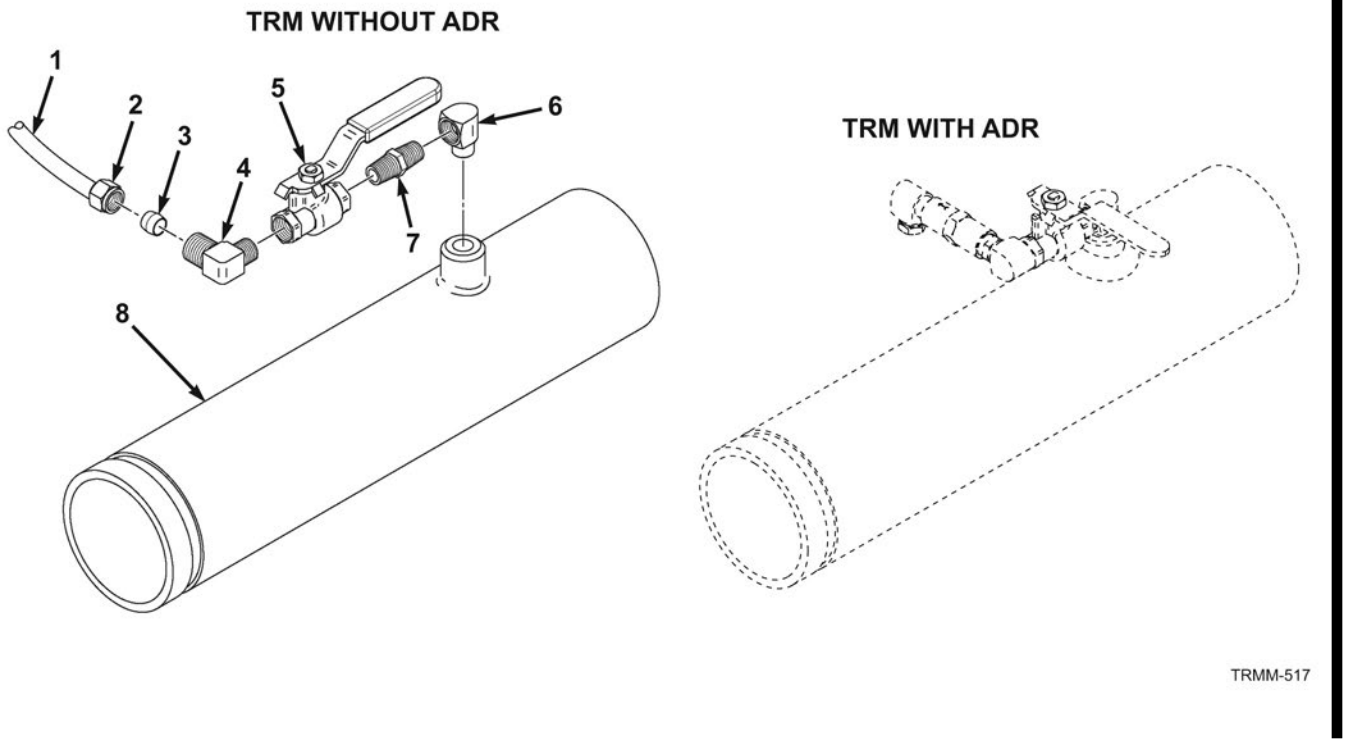


Figure 2. Replacing Vacuum Breaker (VB1).

END OF TASK

CLEANING

WARNING

Solvent cleaning compound MIL-PRF-680 Type III is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Keep away from open flames and other sources of ignition. Failure to comply may cause injury to personnel.

1. Remove all buildup of dirt, oil, and debris from threads.
2. Clean all metal parts with a cleaning cloth and solvent cleaning compound.

CLEANING - Continued

3. Allow parts to dry thoroughly.

END OF TASK

INSTALLATION

WARNING

Thread sealing compound is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Failure to comply may cause injury to personnel.

1. Apply thread sealing compound to all threads except where tube nut connects to elbow.

NOTE

Do not over rotate elbow on pipe. Clocking valve assembly cannot be reversed or seal could be compromised.

2. Install elbow (Figure 2, Item 4) on vacuum breaker (VB1) (Figure 2, Item 5).
3. Install elbow (Figure 2, Item 6) on nipple (Figure 2, Item 7), then on new vacuum breaker (VB1) (Figure 2, Item 5).

NOTE

- Perform Step 4 if replacing vacuum breaker (VB1) on TRM with ADR.
- Perform Steps 5 through 7 for TRM without ADR.

4. Install vacuum breaker check valve (V23) (WP 0144.3).
5. Install elbow (Figure 2, Item 4), nipple (Figure 2, Item 7), elbow (Figure 2, Item 6) and valve (Figure 2, Item 5) onto pipe (Figure 2, Item 8).
6. If necessary, install new ferrule (Figure 2, Item 3) and tube nut (Figure 2, Item 2) on tube (Figure 2, Item 1) and connect tube (Figure 2, Item 1) to elbow (Figure 2, Item 4) and secure with tube nut (Figure 2, Item 2).
7. Install vapor recovery line dust cap (Figure 3, Item 1).

INSTALLATION - Continued

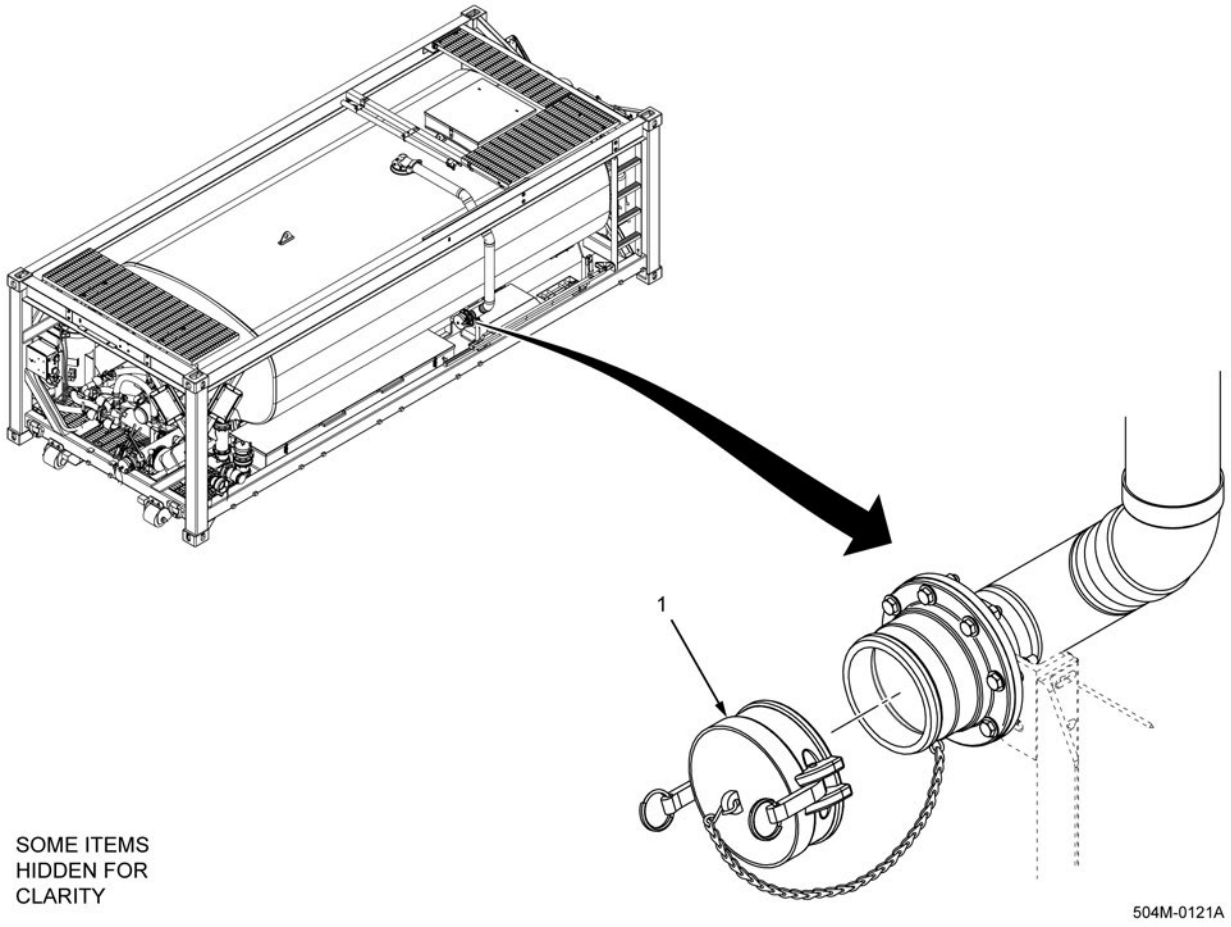


Figure 3. Installing Vapor Recovery Line Dust Cap.

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
POWER CONTROL BOX REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool kit, general mechanic's (WP 0217, Table 1, Item 13)

Materials/Parts
Locknuts Qty: 4 (WP 0192, Figure 46, Item 4)
Washer, lock, internal tooth (WP 0192, Figure 46, Item 5)
Power Control Box Assembly (WP 0192, Figure 46, Item 1)

Personnel Required
91J Quartermaster and Chemical Equipment Repairer

References
TM 10-4930-371-10

Equipment Condition
MFS TRM grounded (TM 10-4930-371-10)
MFS TRM shut down (TM 10-4930-371-10)
MFS TRM power disconnected (TM 10-4930-371-10)

Time to Complete
0.5 Hour(s)

REMOVAL

WARNING

The MFS TRM has 18-30 VDC voltage present at electrical connections. Electrical shock can cause injury or death to personnel. When replacing or servicing any electrical component, disconnect power cable. Failure to comply could result in injury or death to personnel.

NOTE

Note orientation of hardware and components to aid in installation.

1. Ensure power is disconnected from MFS TRM (TM 10-4930-371-10).
2. Loosen two screws (Figure 1, Item 2) and open power control box cover (Figure 1, Item 1).

REMOVAL - Continued

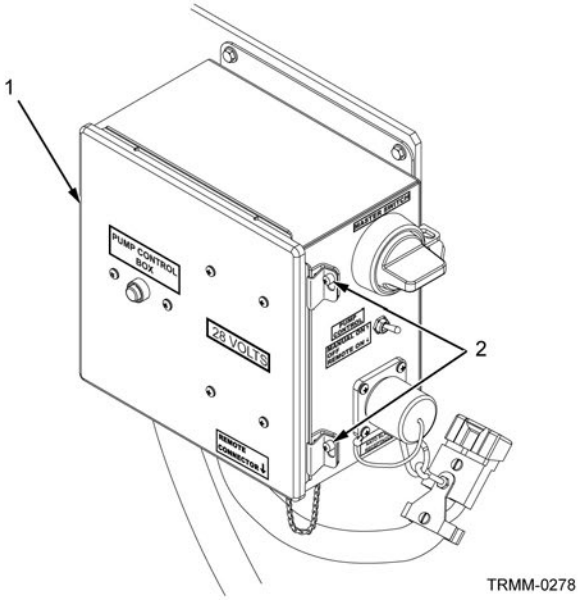


Figure 1. Opening Power Control Box.

REMOVAL - Continued

3. Remove two nuts (Figure 2, Item 5) and four flat washers (Figure 2, Item 6), tag connections and detach two lugs (Figure 2, Item 4) from EMI channel filter (Figure 2, Item 1).
4. Remove two ferrite cores (Figure 2, Item 2) from cables (Figure 2, Item 3).

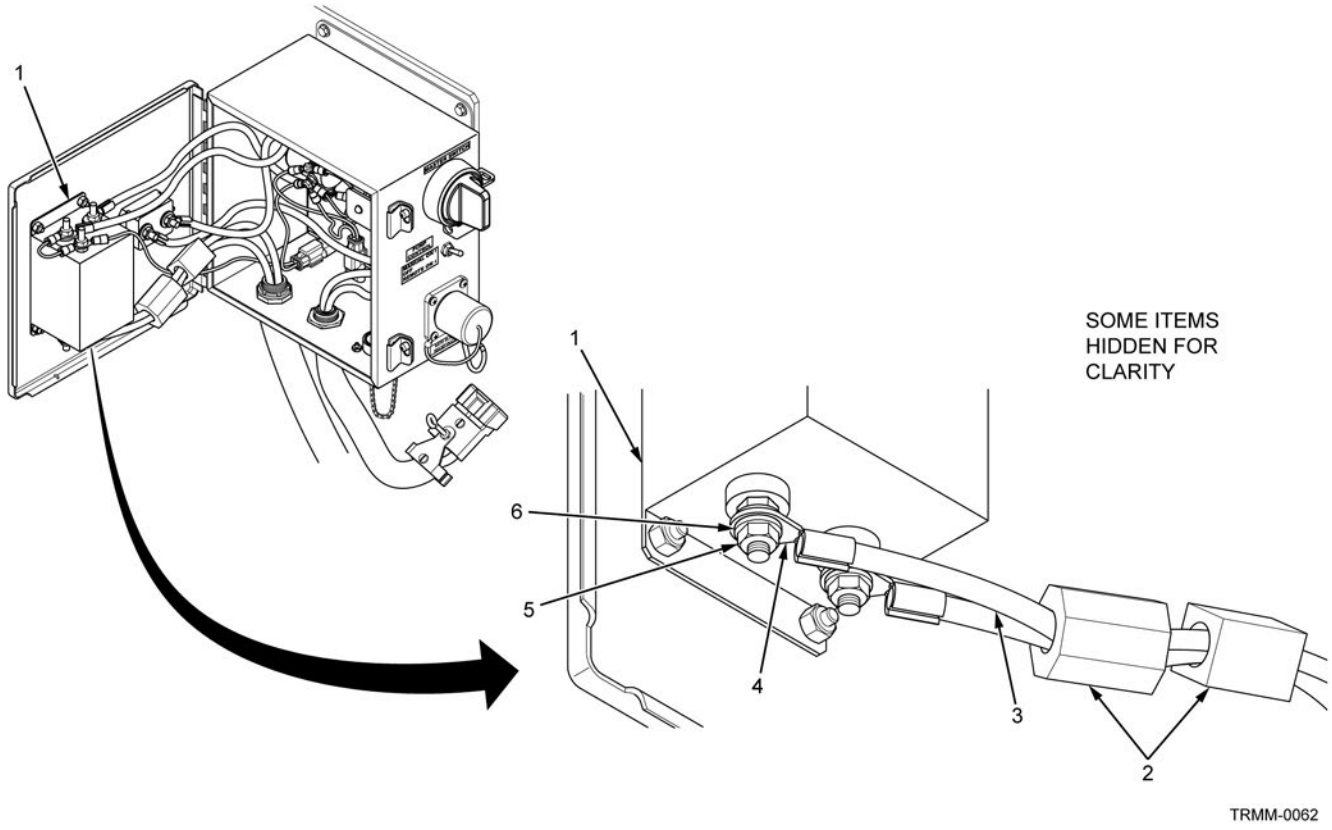


Figure 2. Disconnecting Electric Motor Wires.

5. Unscrew conduit nut (Figure 3, Item 1) and pull cables (Figure 3, Item 4) out of power control box (Figure 3, Item 2).

REMOVAL - Continued

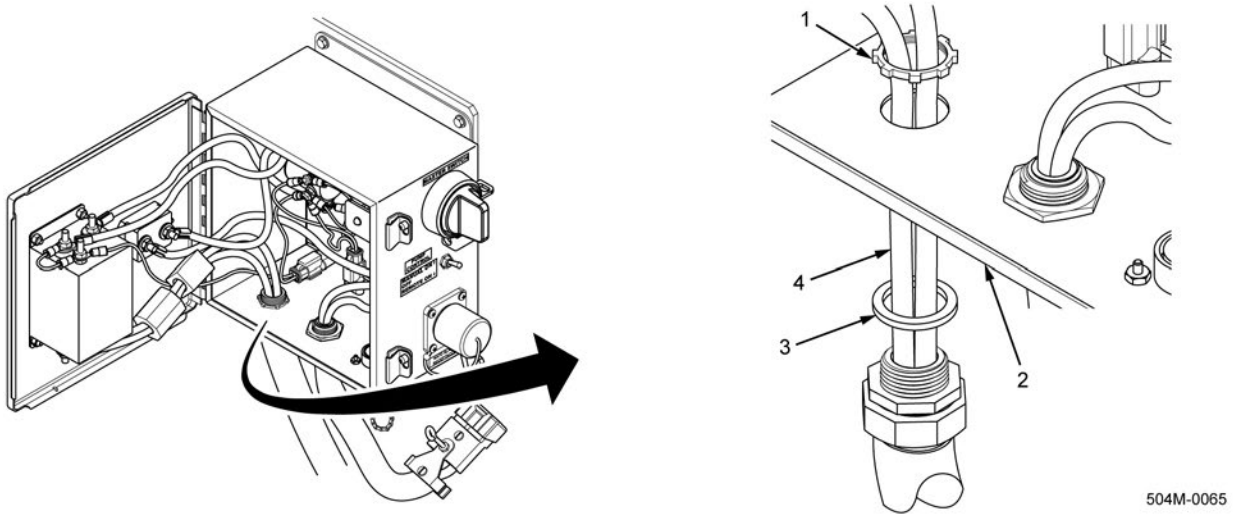


Figure 3. Removing Electric Motor Wires.

6. Remove locknut (Figure 4, Item 5), three flat washers (Figure 4, Item 3), clip (Figure 4, Item 6) and bolt (Figure 4, Item 2). Discard locknut.
7. While supporting power control box, remove three locknuts (Figure 4, Item 5) six flat washers (Figure 4, Item 3) and three bolts (Figure 4, Item 2) and remove power control box (Figure 4, Item 1) from support bracket (Figure 4, Item 7) with lockwasher (Figure 4, Item 4). Discard lockwasher and locknuts.

REMOVAL - Continued

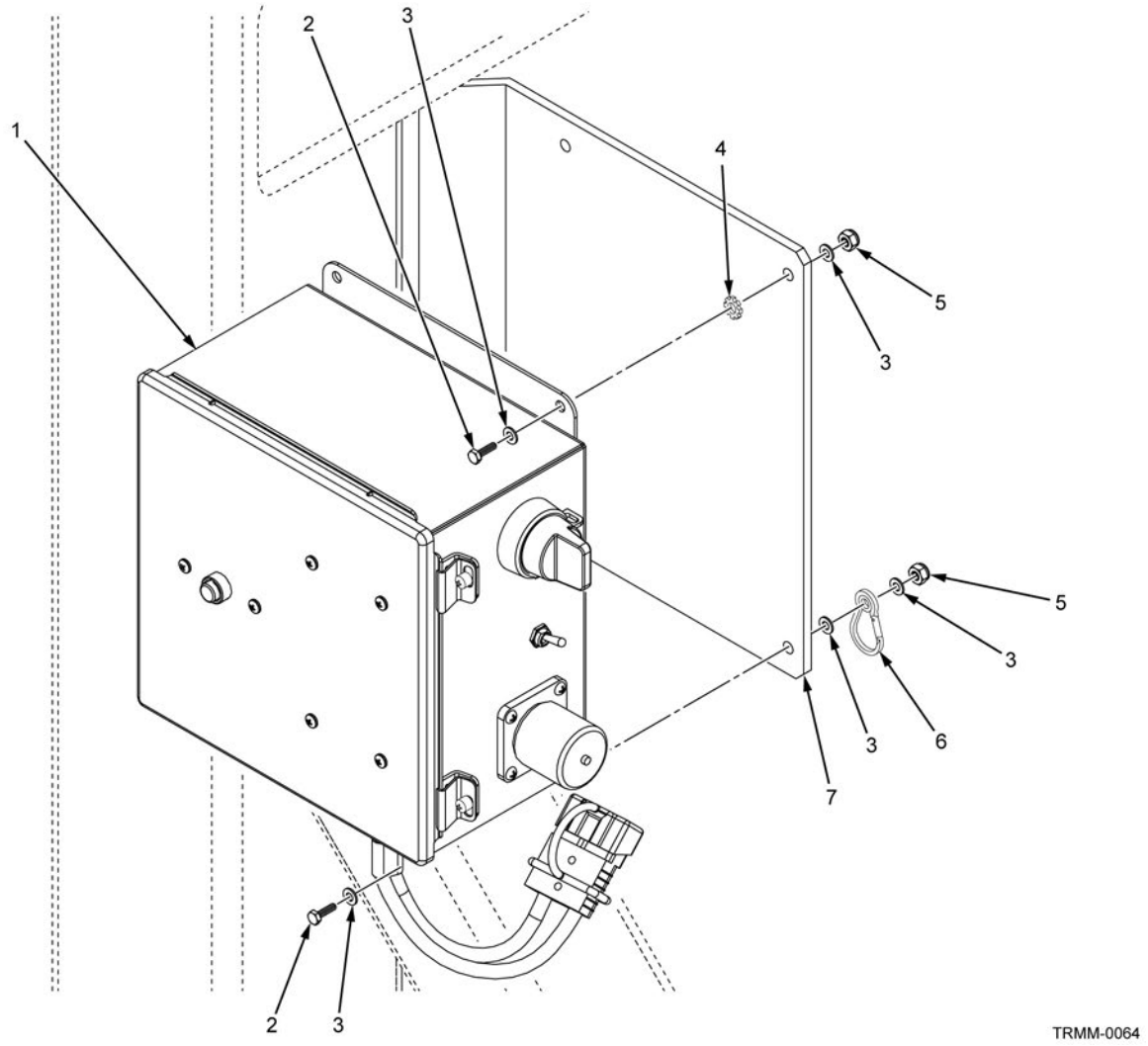


Figure 4. Power Control Box.

END OF TASK

INSTALLATION

1. Loosely install power control box (Figure 4, Item 1) onto support bracket (Figure 4, item 7) and secure with three bolts (Figure 4, Item 2), six flat washers (Figure 4, Item 3), new lockwasher (Figure 4, Item 4), and three new locknuts (Figure 4, Item 5).
2. Loosely install bolt (Figure 4, Item 2), three flat washers (Figure 4, Item 3), clip (Figure 4, Item 6), and new locknut (Figure 4, Item 5).
3. Tighten all hardware securing power control box (Figure 4, Item 1).
4. Feed cables (Figure 5, Item 4) into power control box (Figure 5, Item 2) and secure conduit nut (Figure 5, Item 1).

INSTALLATION - Continued

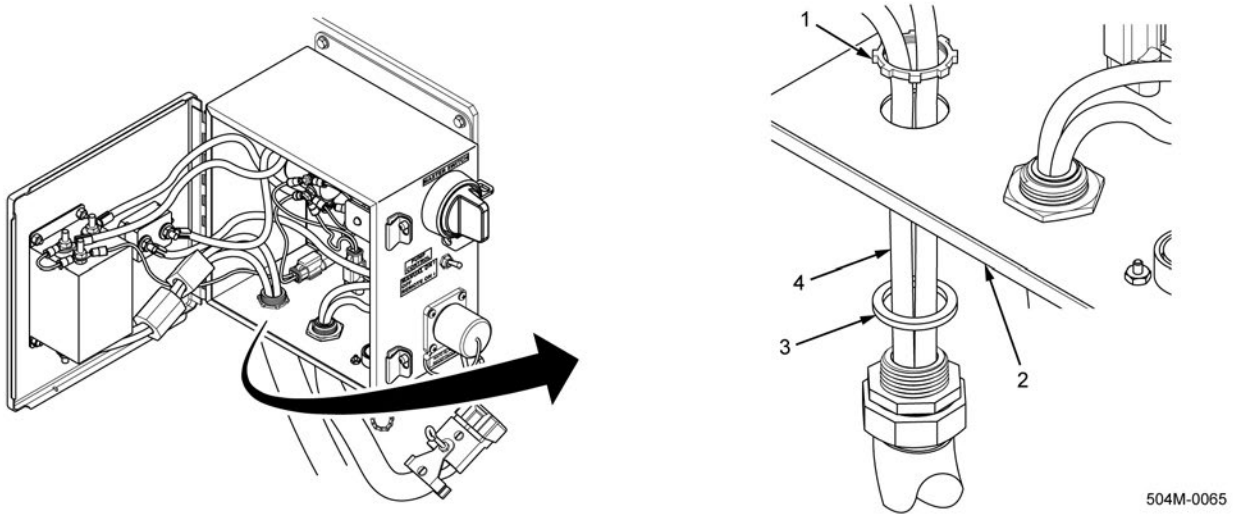


Figure 5. Inserting Electric Motor Wires.

NOTE

Ensure conduit washer on underside of box is between cable assembly end and power control box when inserting cable assembly.

5. Install ferrite cores (Figure 6, Item 2) on cables (Figure 6, Item 3).

WARNING

The MFS TRM has 18-30 VDC voltage present at electrical connections. Electrical shock can cause injury or death to personnel. When replacing or servicing any electrical component, disconnect power cable. Failure to comply could result in injury or death to personnel.

CAUTION

Do not allow the positive and negative cables to make contact with each other or any metal part of the equipment. Failure to comply could result in damage to equipment.

6. Attach lugs (Figure 6, Item 4) to EMI channel filter (Figure 6, Item 1) and secure with four flat washers (Figure 6, Item 6) and two nuts (Figure 6, Item 5).
7. Close power control box (Figure 5, Item 2) and tighten two screws.

INSTALLATION - Continued

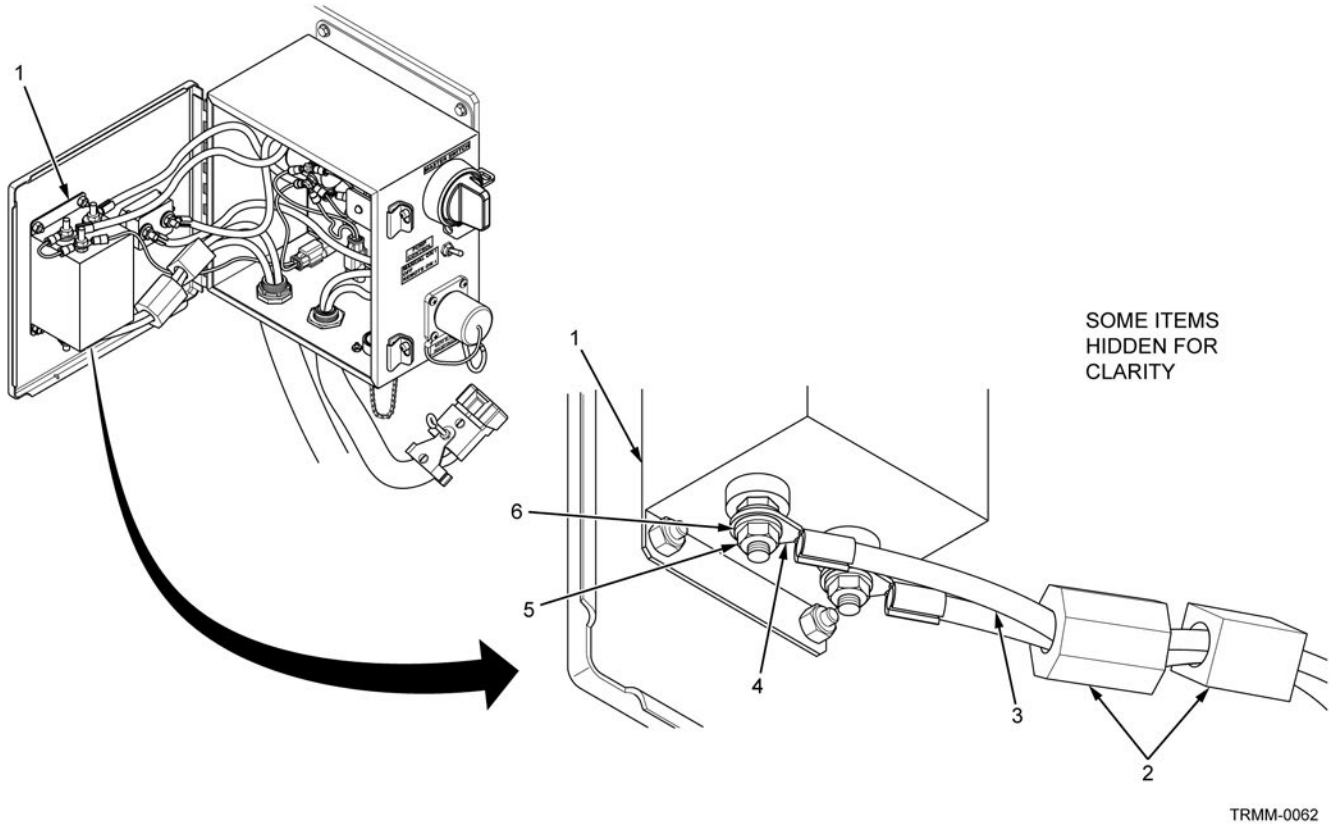


Figure 6. Connecting Electric Motor Wires.

END OF TASK

FOLLOW-ON MAINTENANCE

Apply power to MFS TRM to verify proper operation (TM 10-4930-371-10).

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
POWER CONTROL BOX 70 AMP CIRCUIT BREAKER REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
Fire extinguisher (TM 10-4930-371-10)

Materials/Parts
Wire marker books (WP 0216, Table 1, Item 17)
Nut, self-locking, hexagon (LOCKNUTS) Qty: 2 (WP 0193, Figure 47, Item 23)
70 Amp Circuit Breaker (WP 0193, Figure 47, Item 21)

Personnel Required
Quartermaster and Chemical Equipment Repairer 91J

References
TM 10-4930-371-10
Wiring Schematic

Equipment Condition
MFS TRM grounded (TM 10-4930-371-10)
MFS TRM shut down (TM 10-4930-371-10)

Time to Complete
0.2 Hour(s)

REMOVAL

WARNING

Remove all jewelry such as rings, ID tags, watches, bracelets, and neck chains. If jewelry or a tool makes contact across an electrical circuit, a direct short could result in instant heating or electrical shock.

CAUTION

Do not allow the positive and negative cables to make contact with each other or any metal part of the equipment. Failure to comply could result in damage to equipment.

1. Ensure power is disconnected from MFS TRM (TM 10-4930-371-10).
2. Loosen two screws (Figure 1, Item 2) and open power control box cover (Figure 1, Item 1).

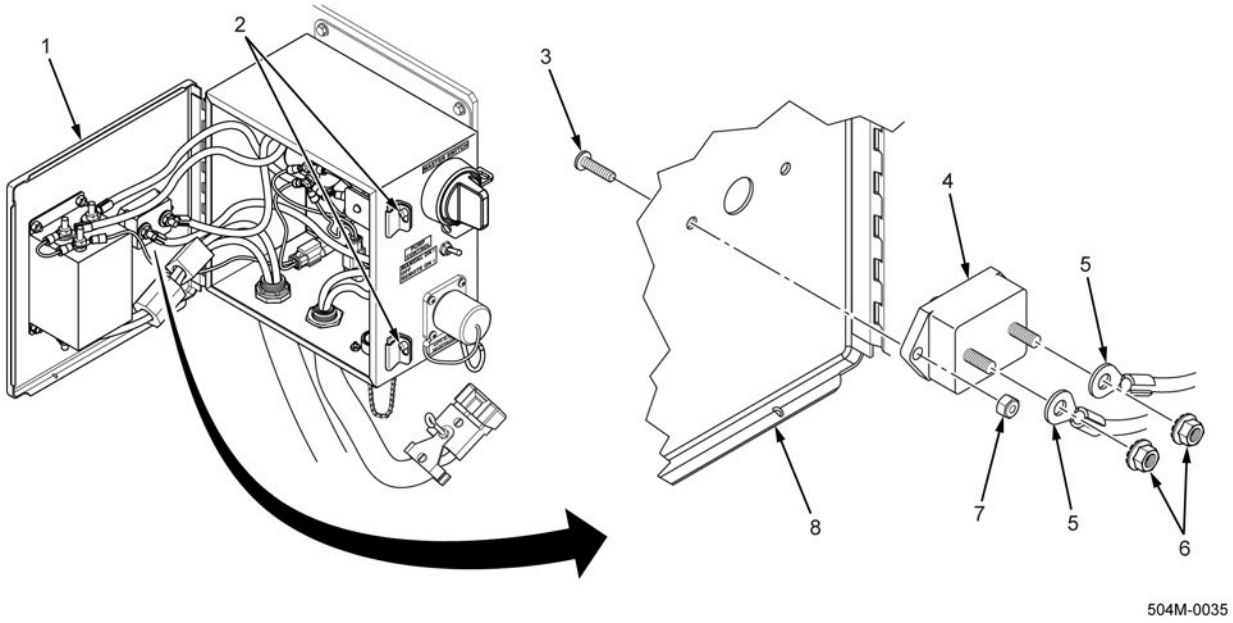


Figure 1. 70 Amp Circuit Breaker Replacement.

NOTE

Note orientation of hardware and components to aid in installation.

3. Tag electrical wires (Figure 1, Item 5) attached to 70A circuit breaker (Figure 1, Item 4) to aid in installation.
4. Remove two hex nuts with tooth washers (Figure 1, Item 6) and disconnect electrical wires (Figure 1, Item 5) from 70A circuit breaker (Figure 1, Item 4).

REMOVAL - Continued

5. Remove two locknuts (Figure 1, Item 7) and two screws (Figure 1, Item 3) and remove 70A circuit breaker (Figure 1, Item 4) from inside power control box cover (Figure 1, Item 8). Discard locknuts.

END OF TASK

INSTALLATION

1. Install 70A circuit breaker (Figure 1, Item 4) onto inside of power control box cover (Figure 1, Item 8), and secure with two screws (Figure 1, Item 3) and two new locknuts (Figure 1, Item 7).
2. Refer to tags and attach electrical wires (Figure 1, Item 5) to 70A circuit breaker (Figure 1, Item 4) and secure with two new hex nuts with tooth washers (Figure 1, Item 6).
3. Remove and discard tags.
4. Close power control box cover (Figure 2, Item 1) and secure by tightening two screws (Figure 2, Item 2).

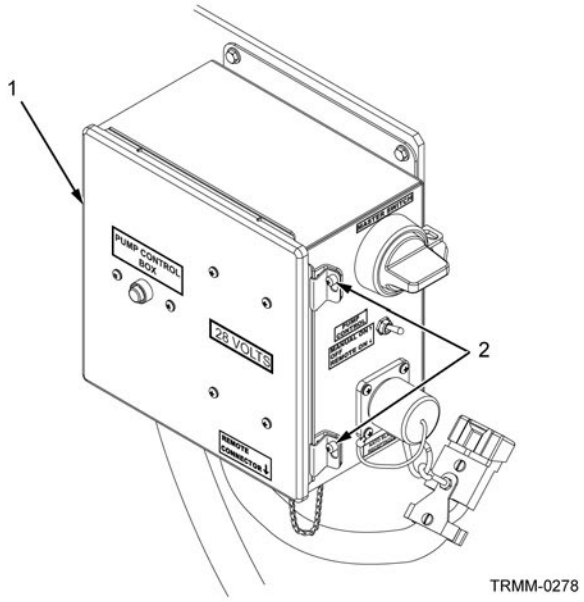


Figure 2. Close Power Control Box Cover.

END OF TASK

FOLLOW-ON MAINTENANCE

Apply power to MFS TRM to verify proper operation (TM 10-4930-371-10).

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
POWER CONTROL BOX DIODE ASSEMBLY REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)

Materials/Parts
- Wire marker books (WP 0216, Table 1, Item 17)
- Lockwasher Qty: 2 (WP 0193, Figure 47, Item 16)
- Diode (WP 0193, Figure 47, Item 18)
- Diode (WP 0193, Figure 47, Item 20)
- Blue, Black Diode Assembly (WP 0193, Figure 47, Item 17)
- Blue, Red Diode Assembly (WP 0193, Figure 47, Item 19)

Personnel Required
- Quartermaster and Chemical Equipment Repairer 91J

References
- TM 10-4930-371-10
- Wiring Schematic

Equipment Condition
- MFS TRM grounded (TM 10-4930-371-10)
- MFS TRM shut down (TM 10-4930-371-10)

Time to Complete
- 0.5 Hour(s)

DIODE REMOVAL

WARNING

- Remove all jewelry such as rings, ID tags, watches, bracelets, and neck chains. If jewelry or a tool makes contact across an electrical circuit, a direct short could result in instant heating or electrical shock.
- Do not allow the positive and negative cables to make contact with each other or any metal part of the equipment. Failure to comply could result in injury or death to personnel or damage to equipment.

NOTE

The following steps apply to black and red diodes.

1. Ensure power is disconnected from MFS TRM (TM 10-4930-371-10).
2. Loosen two screws (Figure 1, Item 2) and open power control box cover (Figure 1, Item 1).
3. Squeeze locking tab of diode holder (Figure 1, Item 4) and pull diode (Figure 1, Item 3) from holder.

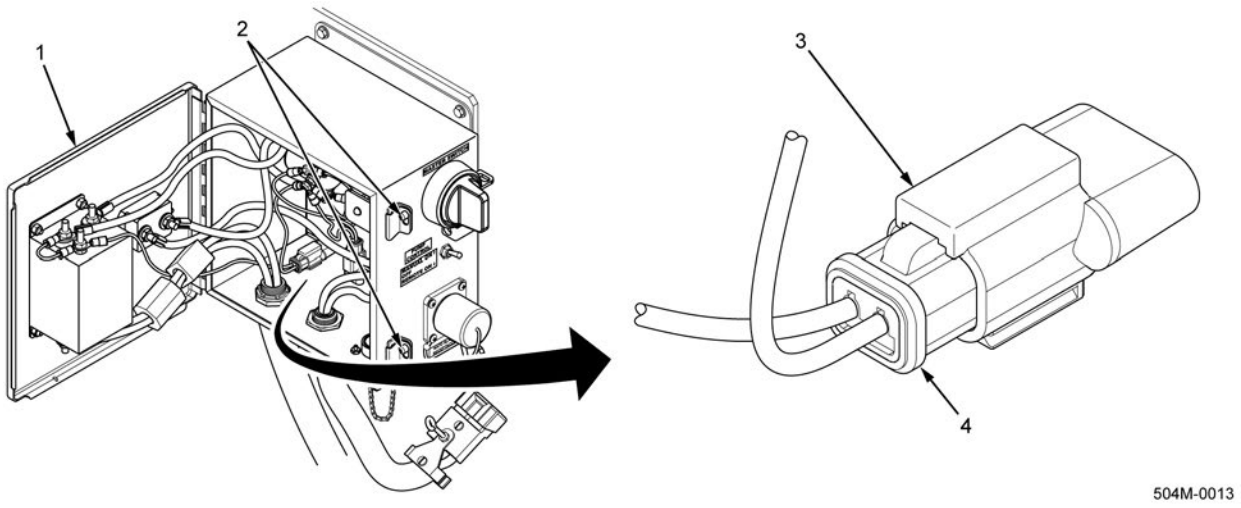


Figure 1. Diode Replacement.

END OF TASK

DIODE INSTALLATION

1. Align tab on diode holder (Figure 1, Item 4) with diode socket and push diode (Figure 1, Item 3) onto holder until it snaps into place.
2. Close power control box cover (Figure 2, Item 1) and secure by tightening two screws (Figure 2, Item 2).

DIODE INSTALLATION - Continued

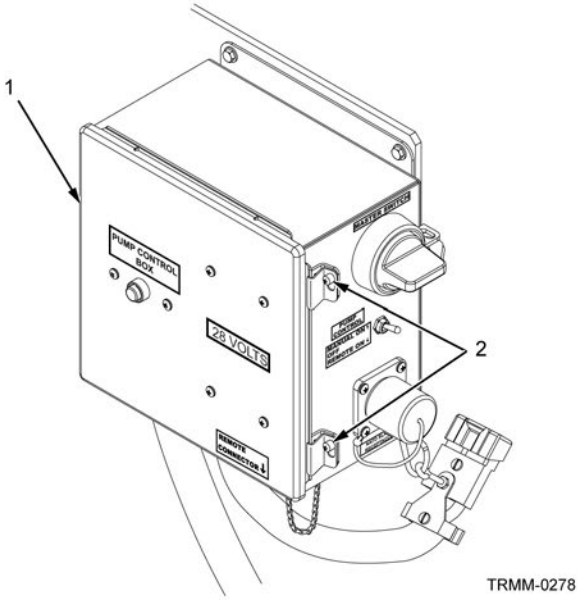


Figure 2. Close Power Control Box Cover.

END OF TASK

DIODE ASSEMBLY REMOVAL

WARNING

- Remove all jewelry such as rings, ID tags, watches, bracelets, and neck chains. If jewelry or a tool makes contact across an electrical circuit, a direct short could result in instant heating or electrical shock.
- Do not allow the positive and negative cables to make contact with each other or any metal part of the equipment. Failure to comply could result in injury or death to personnel or damage to equipment.

NOTE

Diode assemblies have positive and negative wires. Do not reverse wires when connecting diode assemblies.

1. Ensure power is disconnected from MFS TRM (TM 10-4930-371-10).

DIODE ASSEMBLY REMOVAL - Continued

2. Loosen two screws (Figure 3, Item 2) and open power control box cover (Figure 3, Item 1).
3. Tag electrical wires as follows:
    a. Tag blue/black diode assembly electrical wires (Figure 3, Items 12 and 13).
    b. Tag blue/red diode assembly electrical wires (Figure 3, Items 10 and 11).
    c. Tag white electrical wire (Figure 3, Item 8) on relay (Figure 3, Item 3).
    d. Tag black ground (Figure 3, Item 9) on relay (Figure 3, Item 3).
    e. Tag black electrical wire (Figure 3, Item 17) on EMI channel filter (Figure 3, Item 16).
4. Remove two nuts (Figure 3, Items 4 and 6), lockwashers (Figure 3, Items 5 and 7), and five electrical wires (Figure 3, Items 8, 9, 10, 11, 12). Discard lockwashers.
5. Remove nut (Figure 3, Item 14), washer (Figure 3, Item 15), and two electrical wires (Figure 3, Items 13 and 17).

END OF TASK

DIODE ASSEMBLY INSTALLATION

1. To install blue/black wire diode assembly, refer to tags and connect new cable assembly electrical wire (Figure 3, Item 13) and black electrical wire (Figure 3, Item 17) to EMI channel filer (Figure 3, Item 16) and secure with washer (Figure 3, Item 15) and nut (Figure 3, Item 14).
2. Refer to tags and connect blue/black diode assembly electrical wire (Figure 3, Item 12), red/blue diode assembly electrical wire (Figure 3, Item 11), and black ground (Figure 3, Item 9) to relay (Figure 3, Item 3) and secure with new lockwasher (Figure 3, Item 5) and nut (Figure 3, Item 4).
3. To install blue/red diode assembly, refer to tags and connect cable assembly electrical wire (Figure 3, Item 10) and white electrical wire (Figure 3, Item 8) to relay (Figure 3, Item 3) and secure with new lockwasher (Figure 3, Item 7) and nut (Figure 3, Item 6).
4. Remove and discard tags.

DIODE ASSEMBLY INSTALLATION - Continued

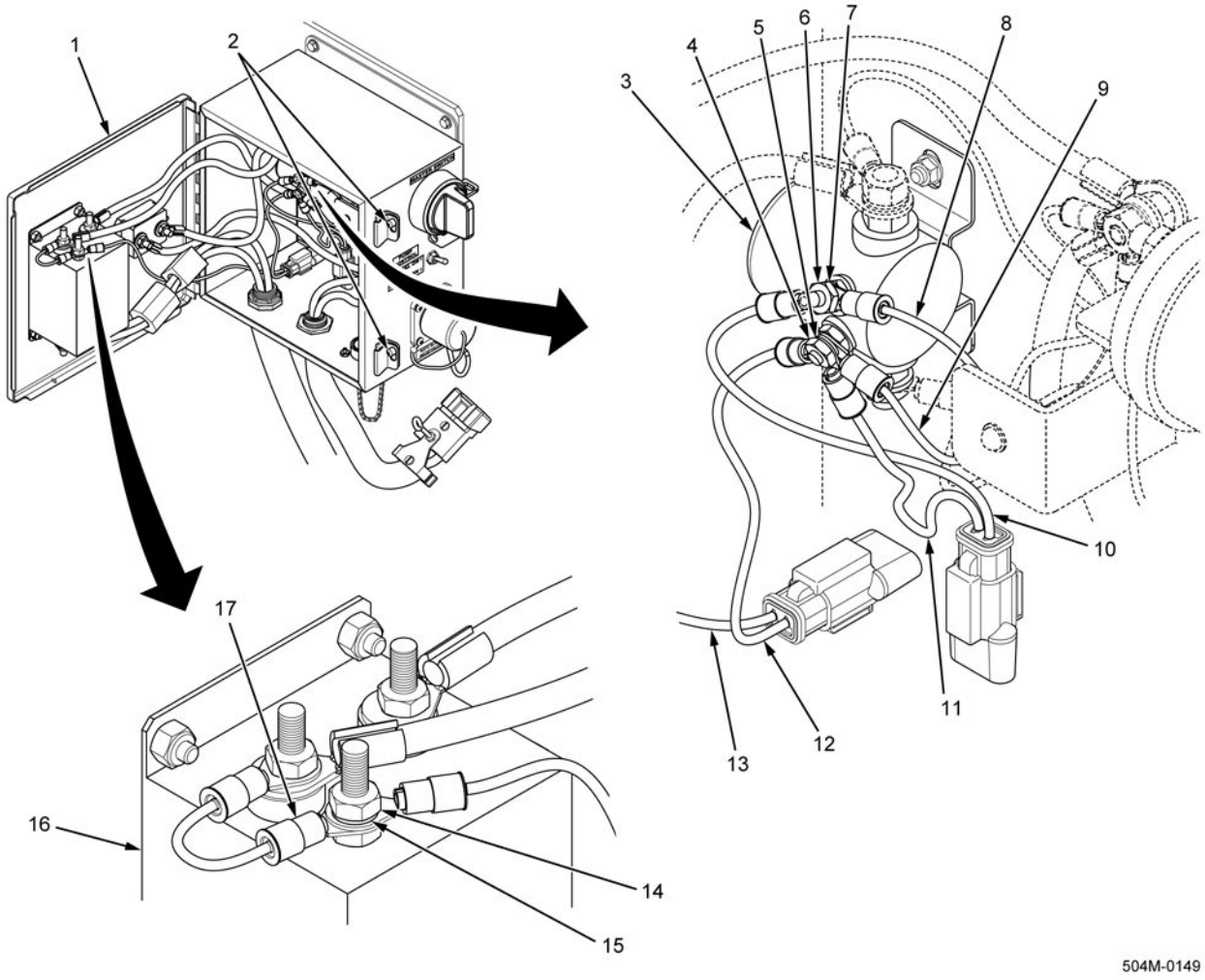


Figure 3. Diode Assembly Replacement.

DIODE ASSEMBLY INSTALLATION - Continued

5. Close power control box cover (Figure 4, Item 1) and secure by tightening two screws (Figure 4, Item 2).

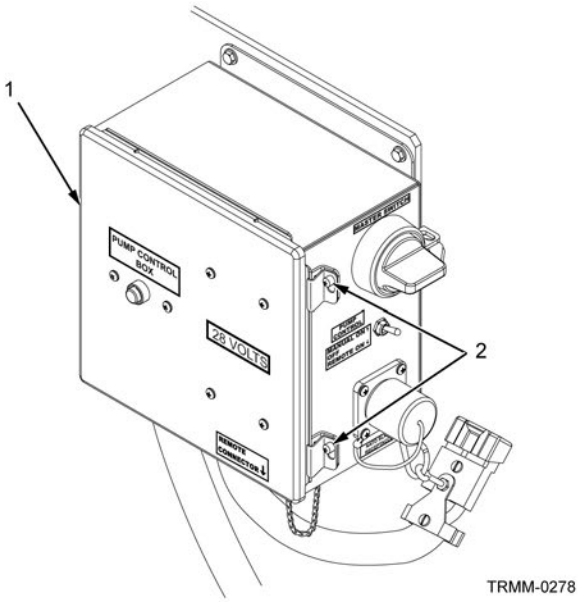


Figure 4. Close Power Control Box Cover.

END OF TASK

FOLLOW-ON MAINTENANCE

Apply power to MFS TRM to verify proper operation (TM 10-4930-371-10).

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
POWER CONTROL BOX EMI CHANNEL FILTER REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
Fire extinguisher (TM 10-4930-371-10)

Materials/Parts
Wire marker books (WP 0216, Table 1, Item 17)
Nut, self-locking, hexagon (LOCKNUTS) Qty: 4 (WP 0193, Figure 47, Item 23)
EMI Channel Filter (WP 0193, Figure 47, Item 22)

Personnel Required
Quartermaster and Chemical Equipment Repairer 91J

References
TM 10-4930-371-10
Wiring Schematic

Equipment Condition
MFS TRM grounded (TM 10-4930-371-10)
MFS TRM shut down (TM 10-4930-371-10)

Time to Complete
0.3 Hour(s)

REMOVAL

WARNING

- Remove all jewelry such as rings, ID tags, watches, bracelets, and neck chains. If jewelry or a tool makes contact across an electrical circuit, a direct short could result in instant heating or electrical shock.
- Do not allow the positive and negative cables to make contact with each other or any metal part of the equipment. Failure to comply could result in injury or death to personnel or damage to equipment.

1. Ensure power is disconnected from MFS TRM (TM 10-4930-371-10).
2. Loosen two screws (Figure 1, Item 2) and open power control box cover (Figure 1, Item 1).
3. Tag electrical wires (Figure 1, Items 3, 4, 5, 6, 7, and 8) attached to EMI channel filter (Figure 1, Item 11) to aid in installation.

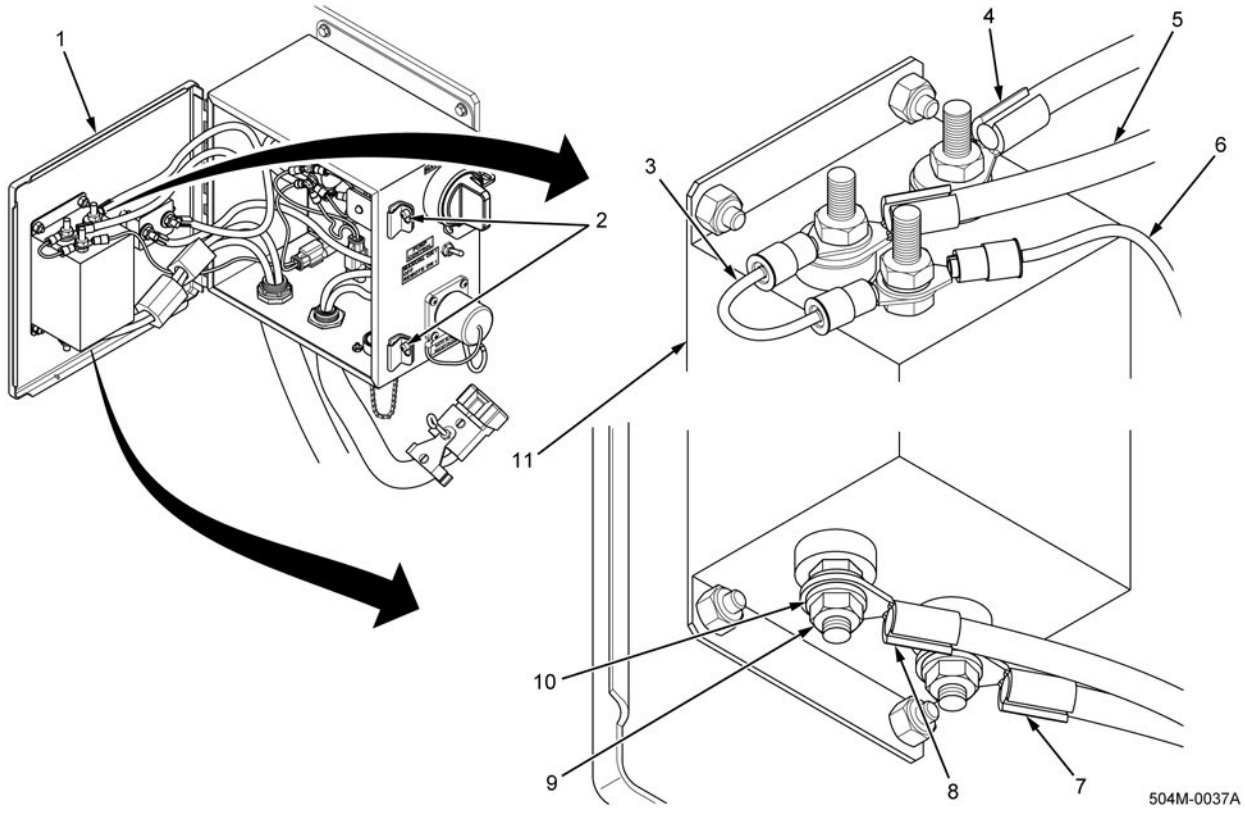


Figure 1. Disconnecting EMI Channel Filter.

4. Remove five nuts (Figure 1, Item 9) and 10 washers (Figure 1, Item 10) and disconnect electrical wires (Figure 1, Items 3, 4, 5, 6, 7, and 8) from EMI channel filter (Figure 1, Item 11).

REMOVAL - Continued

5. Remove four locknuts (Figure 2, Item 4) and screws (Figure 2, Item 1) and remove EMI channel filter (Figure 2, Item 3) from inside of power control box cover (Figure 2, Item 2). Discard locknuts.

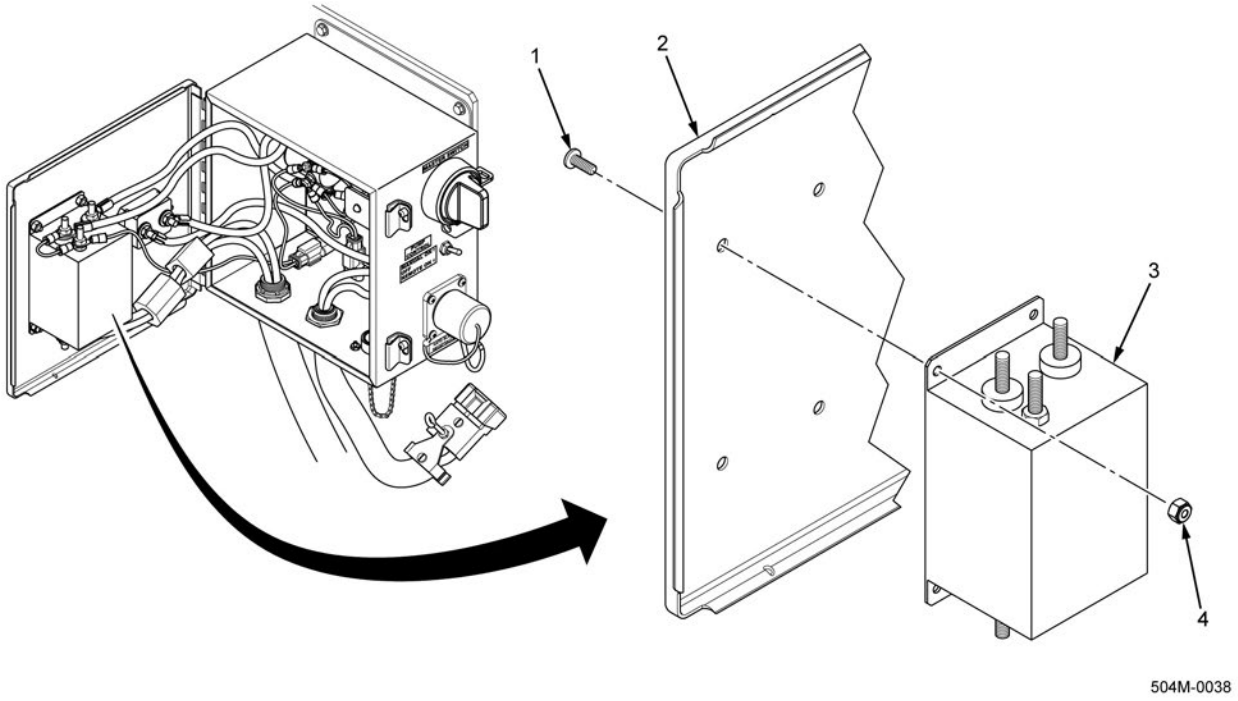


Figure 2. EMI Channel Filter.

END OF TASK

INSTALLATION

1. Install EMI channel filter (Figure 2, Item 3) onto inside of power control box cover (Figure 2, Item 2), and secure with four screws (Figure 2, Item 1) and new locknuts (Figure 2, Item 4).
2. Refer to tags and connect electrical wires (Figure 3, Items 1, 2, 3, 4, 5, and 6) to new EMI channel filter (Figure 3, Item 9), and secure with 10 washers (Figure 3, Item 8) and five nuts (Figure 3, Item 7).

INSTALLATION - Continued

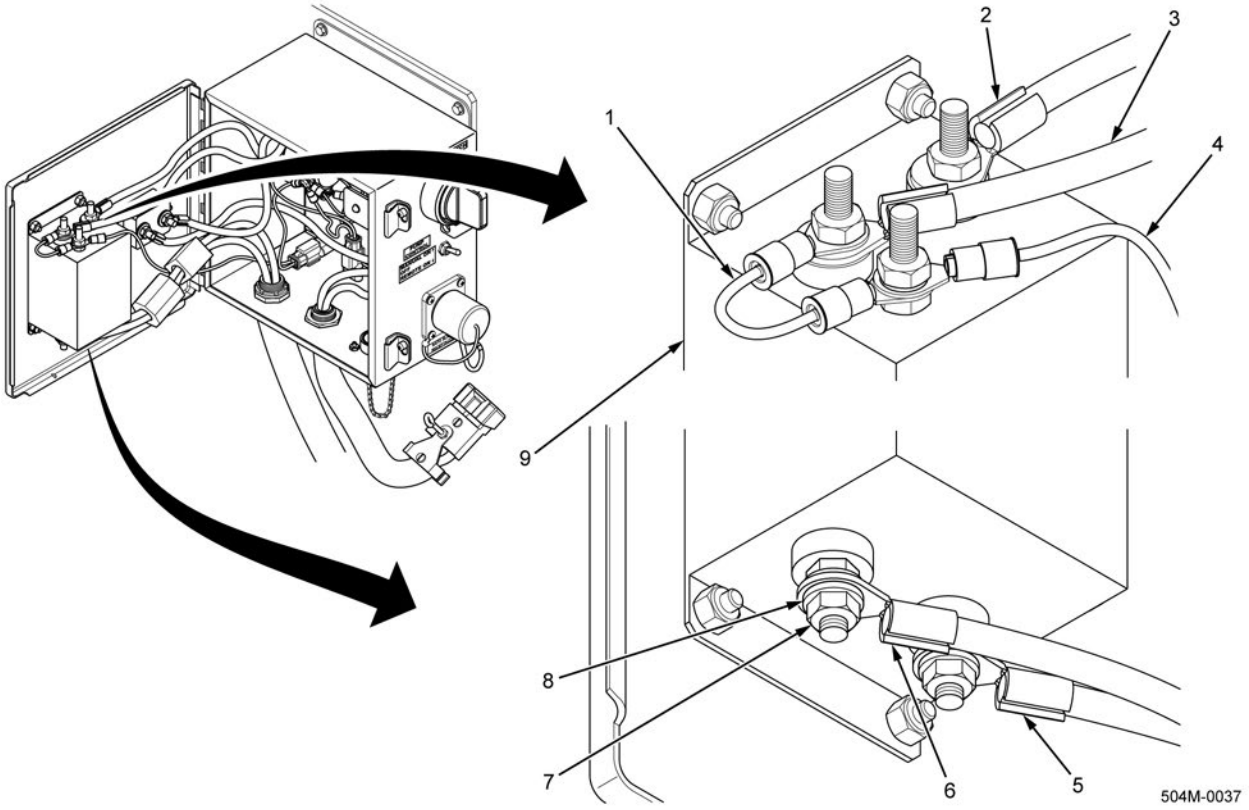


Figure 3. Connecting EMI Channel Filter.

INSTALLATION - Continued

3. Remove and discard tags.
4. Close power control box cover (Figure 4, Item 1) and secure by tightening two screws (Figure 4, Item 2).

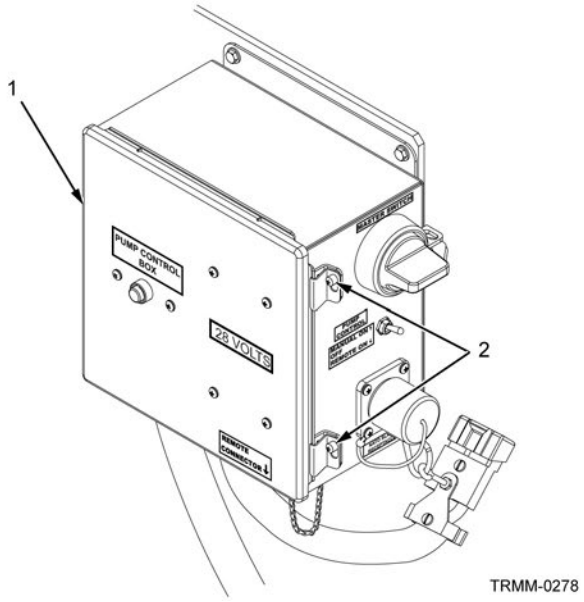


Figure 4. Close Power Control Box Cover.

END OF TASK

FOLLOW-ON MAINTENANCE

Apply power to MFS TRM to verify proper operation (TM 10-4930-371-10).

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
POWER CONTROL BOX MASTER SWITCH REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
Fire extinguisher (TM 10-4930-371-10)
Screwdriver, set, jeweler's (WP 0217, Table 1, Item 11)

Materials/Parts
Wire marker books (WP 0216, Table 1, Item 17)
Switch, Rotary (WP 0193, Figure 47, Item 28)

Personnel Required
Quartermaster and Chemical Equipment Repairer 91J

References
TM 10-4930-371-10
Wiring Schematic

Equipment Condition
MFS TRM grounded (TM 10-4930-371-10)
MFS TRM shut down (TM 10-4930-371-10)

Time to Complete
0.3 Hour(s)

REMOVAL

WARNING

- Remove all jewelry such as rings, ID tags, watches, bracelets, and neck chains. If jewelry or a tool makes contact across an electrical circuit, a direct short could result in instant heating or electrical shock.
- Do not allow the positive and negative cables to make contact with each other or any metal part of the equipment. Failure to comply could result in injury or death to personnel or damage to equipment.

1. Ensure power is disconnected from MFS TRM (TM 10-4930-371-10).
2. Loosen two screws (Figure 1, Item 2) and open power control box cover (Figure 1, Item 1).
3. Tag electrical wires (Figure 1, Items 3 and 7) attached to master switch (Figure 1, Item 6) to aid in installation.

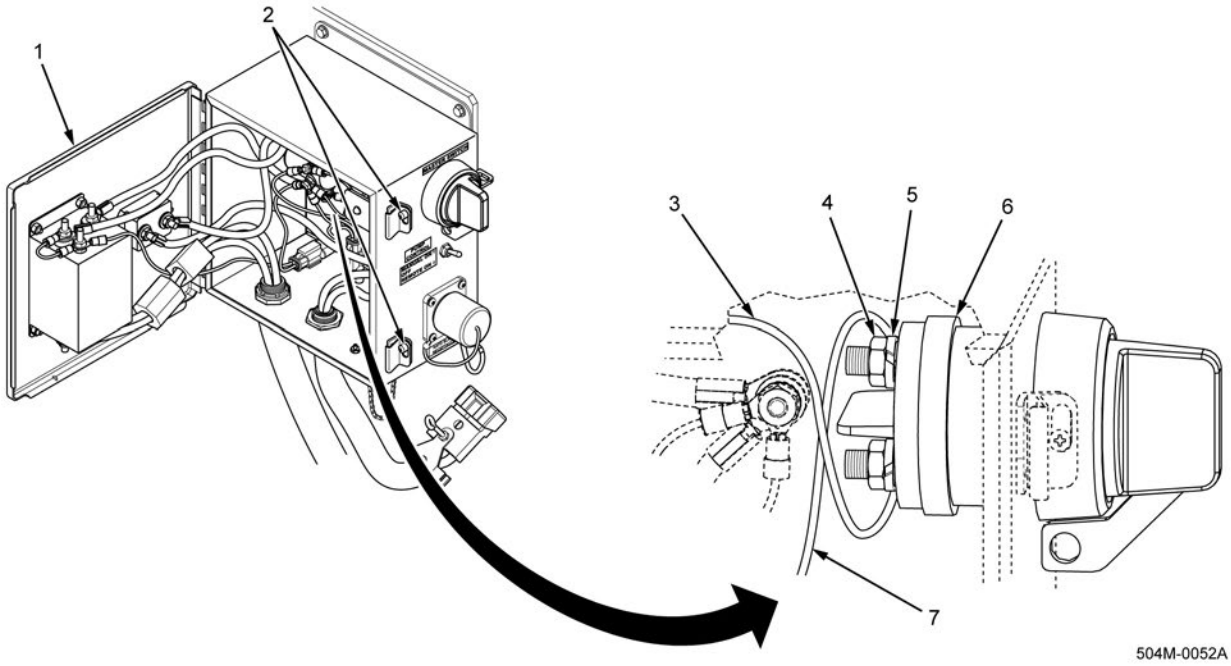


Figure 1. Disconnecting Master Switch.

4. Remove two nuts (Figure 1, Item 4) and two lockwashers (Figure 1, Item 5) and disconnect electrical wires (Figure 1, Items 3 and 7) from master switch (Figure 1, Item 6). Discard lockwashers.

REMOVAL - Continued

5. Remove plug (Figure 2, Item 5), screw (Figure 2, Item 6), and remove master switch knob (Figure 2, Item 4).

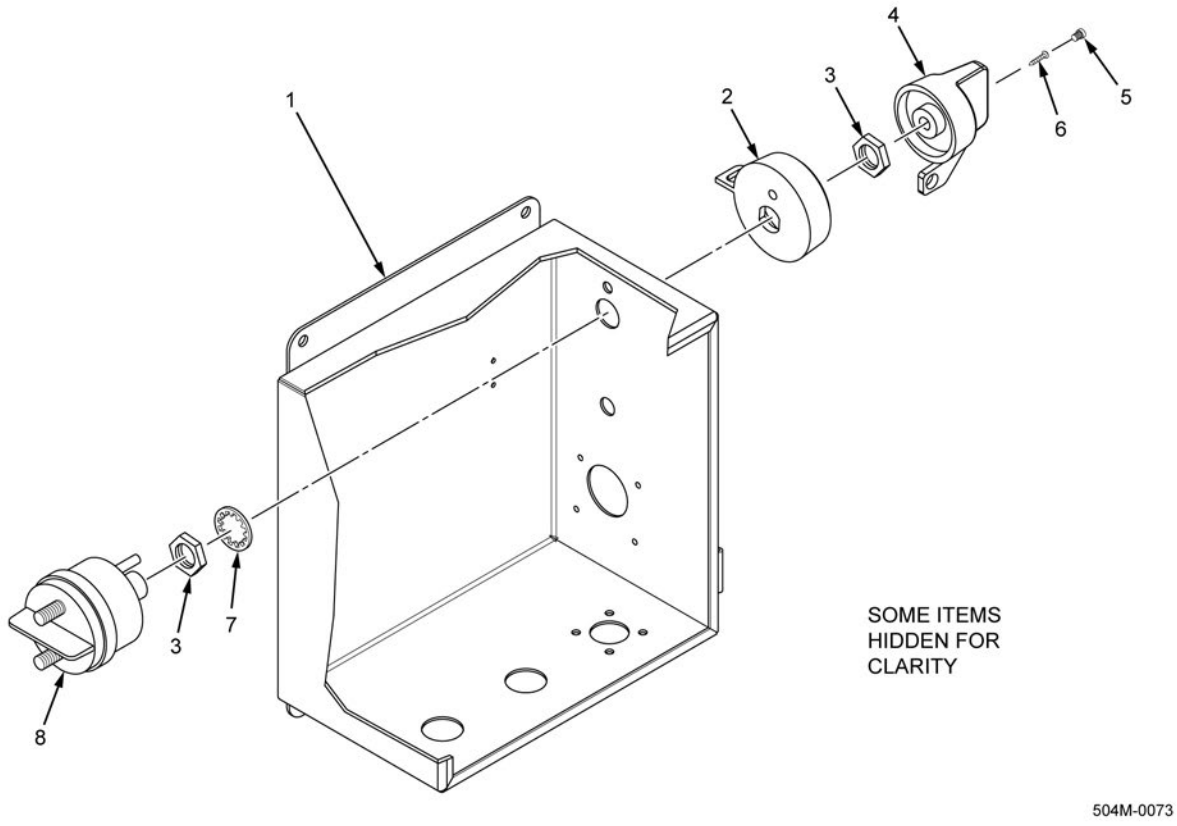


Figure 2. Removing Master Switch.

6. Support master switch (Figure 2, Item 8) from inside power control box (Figure 2, Item 1), and remove nut (Figure 2, Item 3) and bezel (Figure 2, Item 2).
7. Remove master switch (Figure 2, Item 8), with lockwasher (Figure 2, Item 7) and nut (Figure 2, Item 3) from inside power control box (Figure 2, Item 1). Discard lockwasher.

END OF TASK

INSTALLATION

1. Install nut (Figure 3, Item 5) and new lockwasher (Figure 3, Item 9) onto master switch (Figure 3, Item 10).

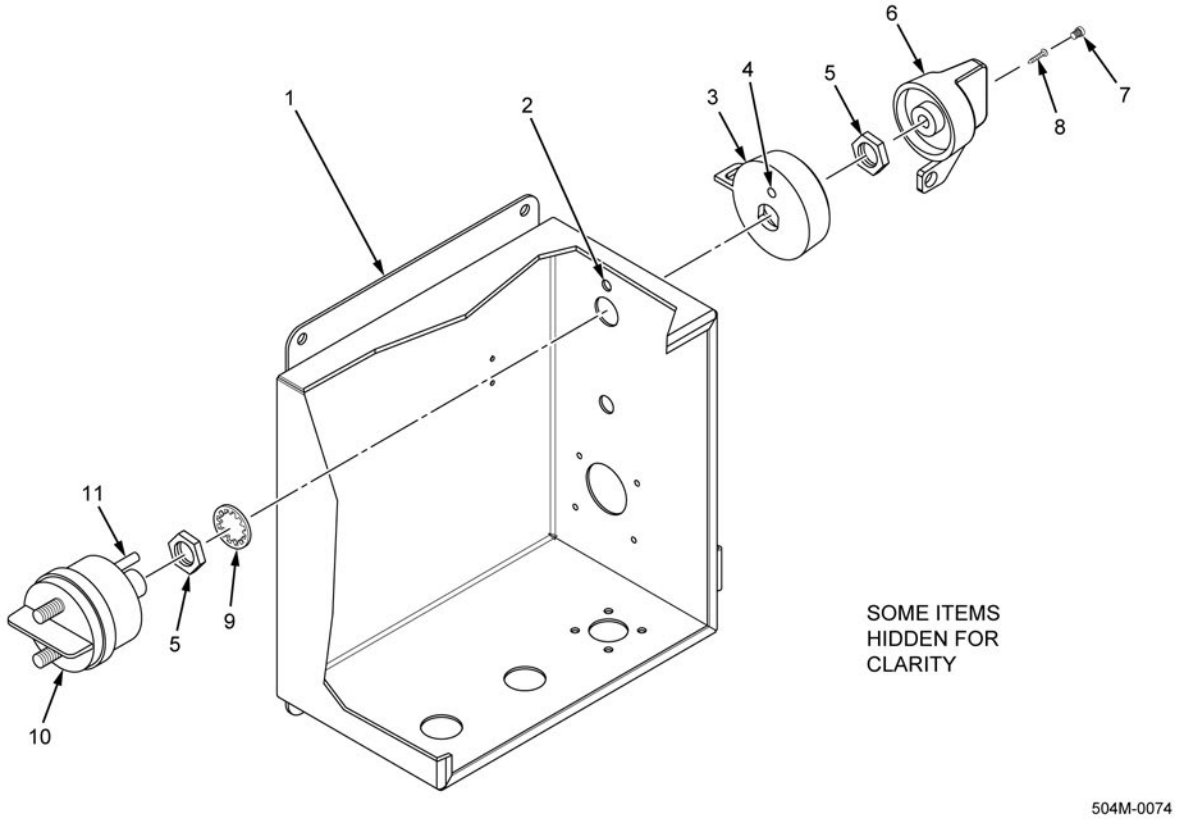


Figure 3. Installing Master Switch.

2. Install master switch (Figure 3, Item 10) with nut (Figure 3, Item 5) and lockwasher (Figure 3, Item 9) onto inside of power control box (Figure 3, Item 1), making sure that alignment pin (Figure 3, Item 11) on master switch (Figure 3, Item 10) passes through alignment hole (Figure 3, Item 2) on power control box (Figure 3, Item 1).
3. Install bezel (Figure 3, Item 3) onto outside of power control box (Figure 3, Item 1), making sure that alignment pin (Figure 3, Item 11) on master switch (Figure 3, Item 10) passes through alignment hole (Figure 3, Item 4) on bezel (Figure 3, Item 3).
4. Secure bezel (Figure 3, Item 3) with nut (Figure 3, Item 5).
5. Install master switch knob (Figure 3, Item 6) onto master switch (Figure 3, Item 10), making sure that flat on master switch knob (Figure 3, Item 6) is aligned with flat on master switch shaft.
6. Secure master switch knob (Figure 3, Item 6) with screw (Figure 3, Item 8), and install plug (Figure 3, Item 7).

INSTALLATION - Continued

7. Refer to tags and attach electrical wires (Figure 4, Items 1 and 5) to master switch (Figure 4, Item 4) and secure with two new lockwashers (Figure 4, Item 3) and two nuts (Figure 4, Item 2).

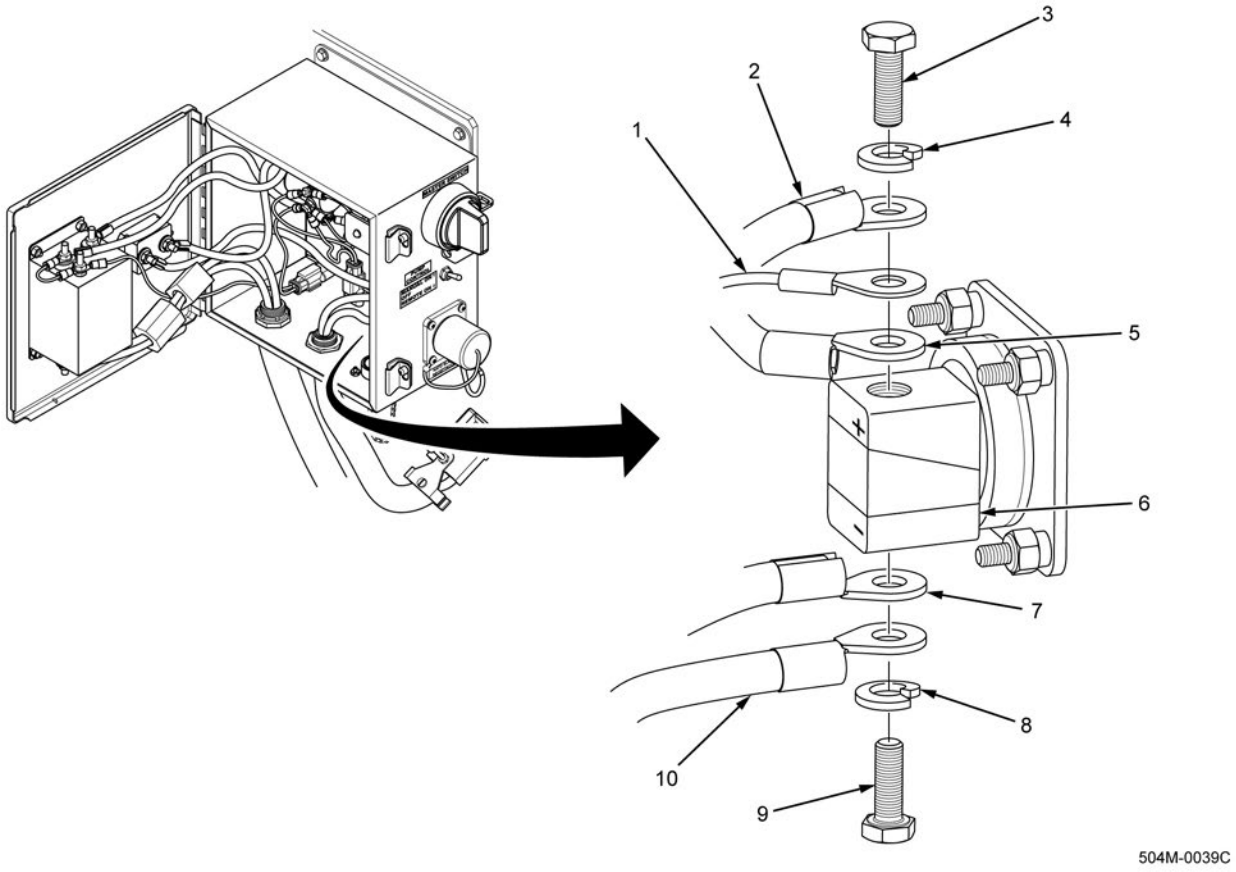


Figure 4. Connecting Master Switch.

8. Remove and discard tags.
9. Close power control box cover (Figure 5, Item 1) and secure by tightening two screws (Figure 5, Item 2).

INSTALLATION - Continued

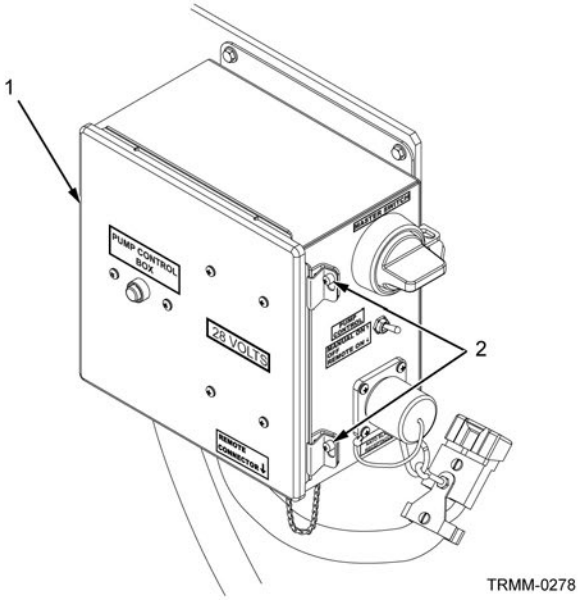


Figure 5. Close Power Control Box Cover.

END OF TASK

FOLLOW-ON MAINTENANCE

Apply power to MFS TRM to verify proper operation (TM 10-4930-371-10).

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
POWER CONTROL BOX NATO SLAVE RECEPTACLE REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)

Materials/Parts
- Wire marker books (WP 0216, Table 1, Item 17)
- Washer, lock Qty: 2 (WP 0193, Figure 47, Item 34)
- NATO Slave Receptacle (WP 0193, Figure 47, Item 31)

Personnel Required
- Quartermaster and Chemical Equipment Repairer 91J

References
- TM 10-4930-371-10
- Wiring Schematic

Equipment Condition
- MFS TRM grounded (TM 10-4930-371-10)
- MFS TRM shut down (TM 10-4930-371-10)

Time to Complete
- 0.4 Hour(s)

REMOVAL

WARNING

- Remove all jewelry such as rings, ID tags, watches, bracelets, and neck chains. If jewelry or a tool makes contact across an electrical circuit, a direct short could result in instant heating or electrical shock.
- Do not allow the positive and negative cables to make contact with each other or any metal part of the equipment. Failure to comply could result in injury or death to personnel or damage to equipment.

1. Ensure power is disconnected from MFS TRM (TM 10-4930-371-10).
2. Loosen two screws (Figure 1, Item 2) and open power control box cover (Figure 1, Item 1).
3. Tag electrical wires (Figure 1, Items 3, 4, 7, 9, and 12) attached to NATO slave receptacle (Figure 1, Item 8) to aid in installation.

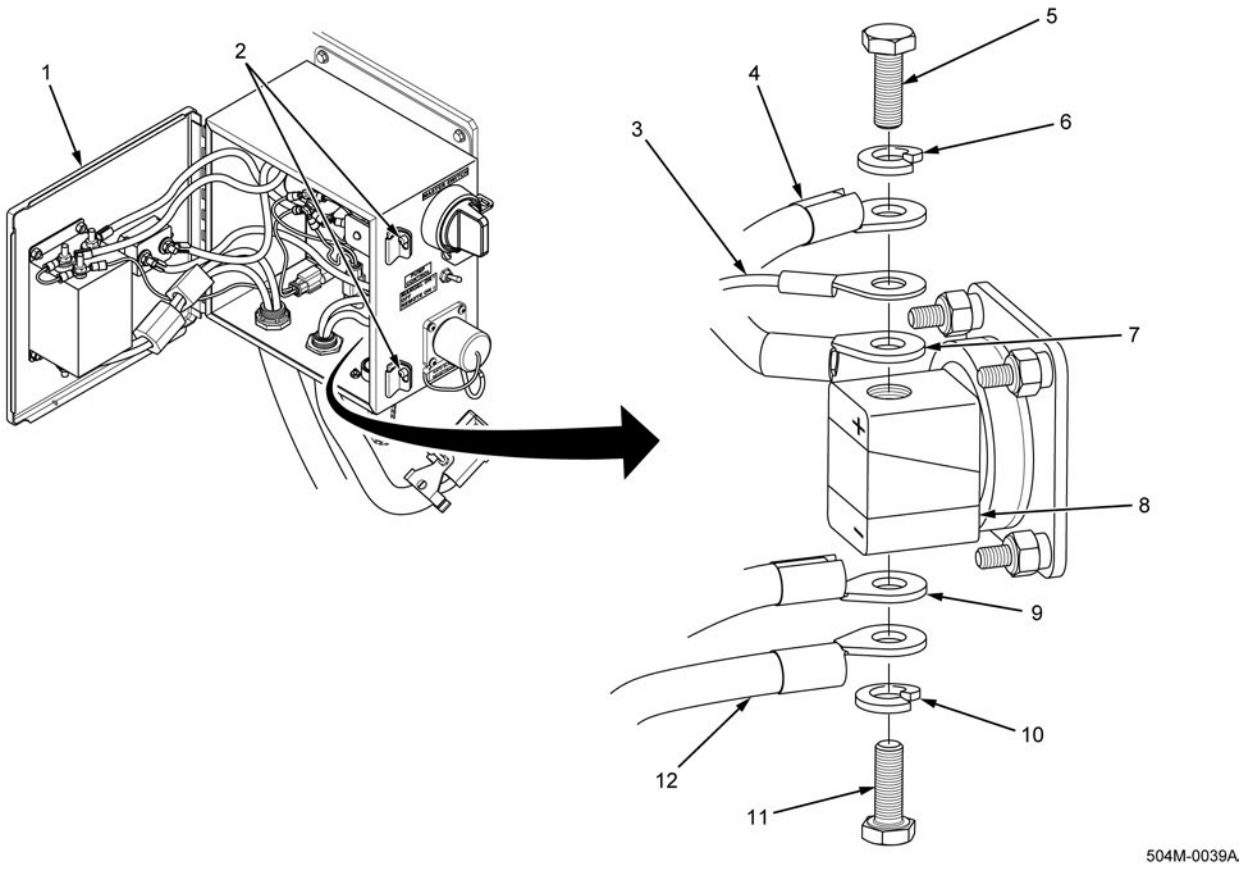


Figure 1. Disconnecting NATO Slave Receptacle.

REMOVAL - Continued

4. Remove two bolts (Figure 1, Items 5 and 11) and lock washers (Figure 1, Items 6 and 10) and disconnect electrical wires (Figure 1, Items 3, 4, 7, 9, and 12) from NATO slave receptacle (Figure 1, Item 8). Discard lock washer.
5. While supporting the NATO slave receptacle (Figure 2, Item 3) remove four locknuts (Figure 2, Item 7), screws (Figure 2, Item 4), dust cap lanyard (Figure 2, Item 5), backing plate (Figure 2, Item 6), and remove NATO slave receptacle (Figure 2, Item 3) with gasket (Figure 2, Item 2) from outside power control box (Figure 2, Item 1). Discard locknuts.

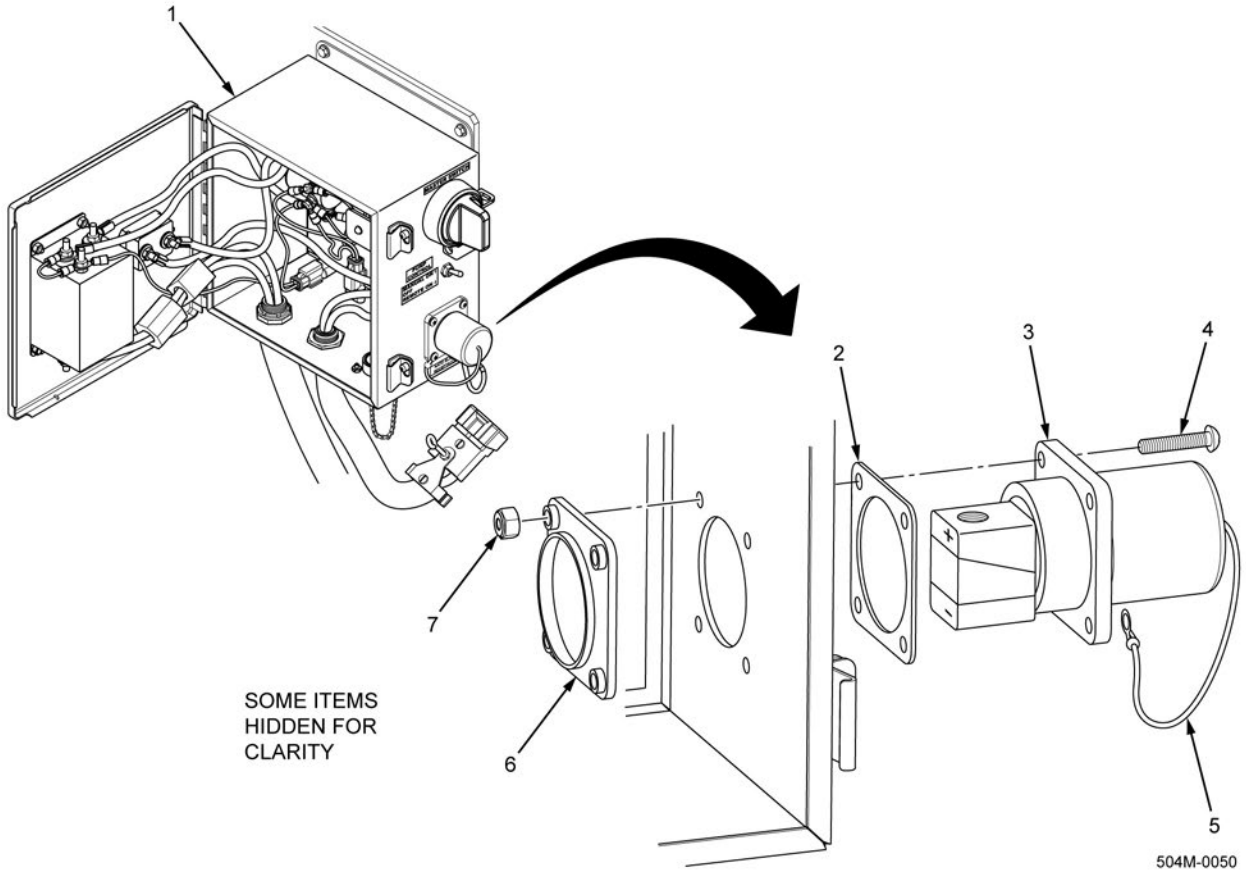


Figure 2. Removing NATO Slave Receptacle.

END OF TASK

INSTALLATION

1. Install NATO slave receptacle (Figure 3, Item 3) with gasket (Figure 3, Item 2) onto outside of power control box (Figure 3, Item 1), making sure that threaded, negative post (Figure 3, Item 6) is facing bottom of power control box (Figure 3, Item 1).

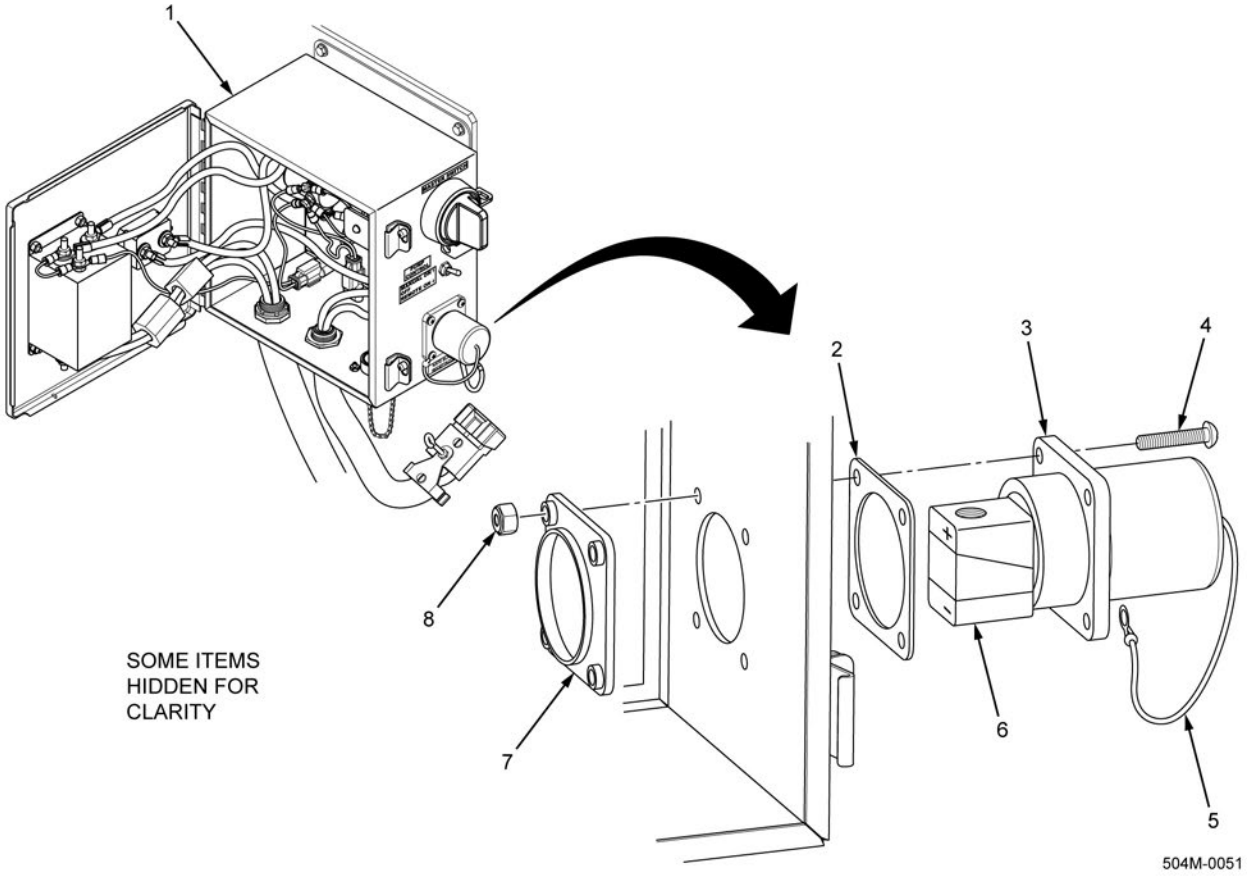


Figure 3. Installing NATO Slave Receptacle.

2. Install backing plate (Figure 3, Item 7) onto NATO slave receptacle (Figure 3, Item 3) from inside power control box (Figure 3, Item 1).
3. Secure NATO slave receptacle with four screws (Figure 3, Item 4) and new locknuts (Figure 3, Item 8) with dust cap lanyard (Figure 3, Item 5) secured to a bottom screw on the outside of the box.

INSTALLATION - Continued

4. Refer to tags and attach electrical wires (Figure 4, Items 1, 2, 5, 7, and 10) to NATO slave receptacle (Figure 4, Item 6) and secure with two new lockwashers (Figure 4, Items 4 and 8) and bolts (Figure 4, Items 3 and 9).

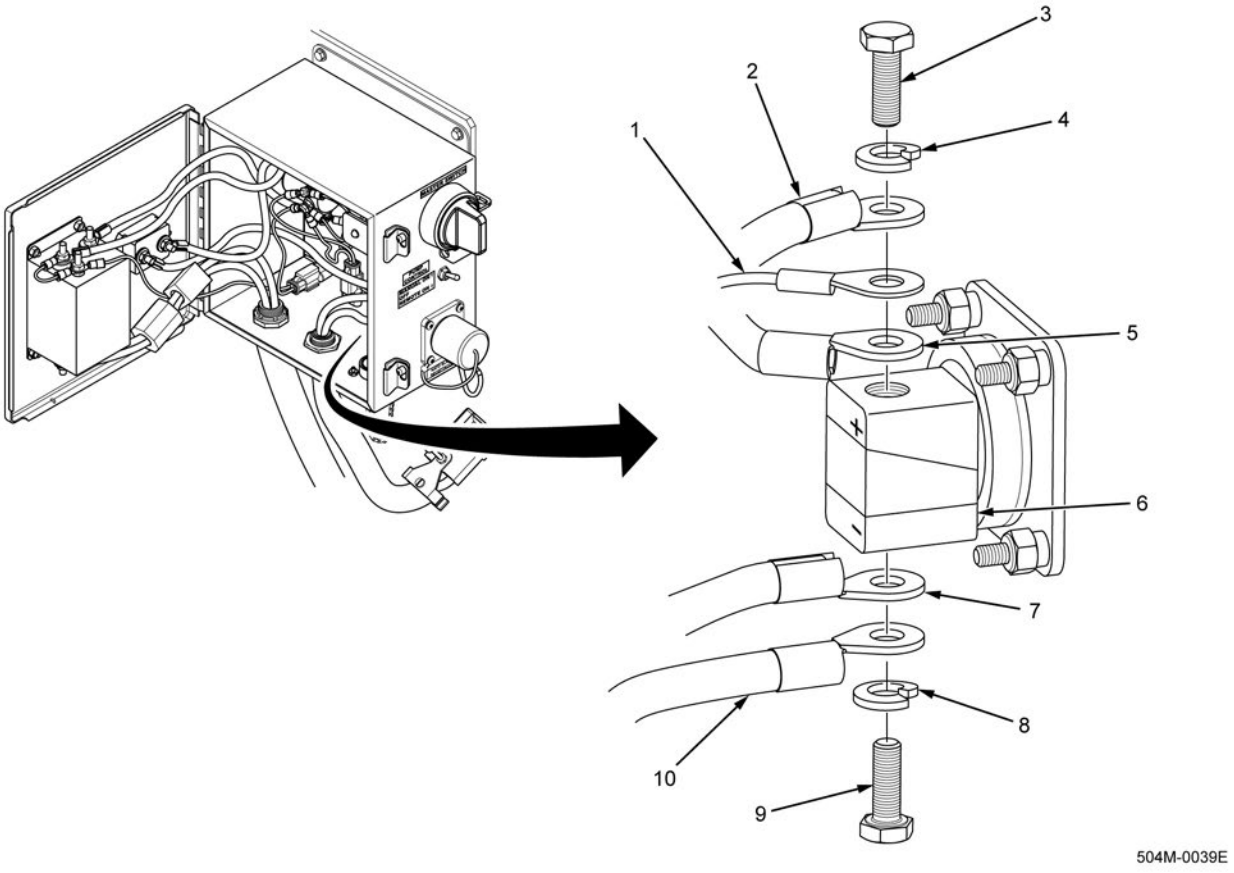


Figure 4. Connecting NATO Slave Receptacle.

5. Remove and discard tags.
6. Close power control box cover (Figure 5, Item 1) and secure by tightening two screws (Figure 5, Item 2).

INSTALLATION - Continued

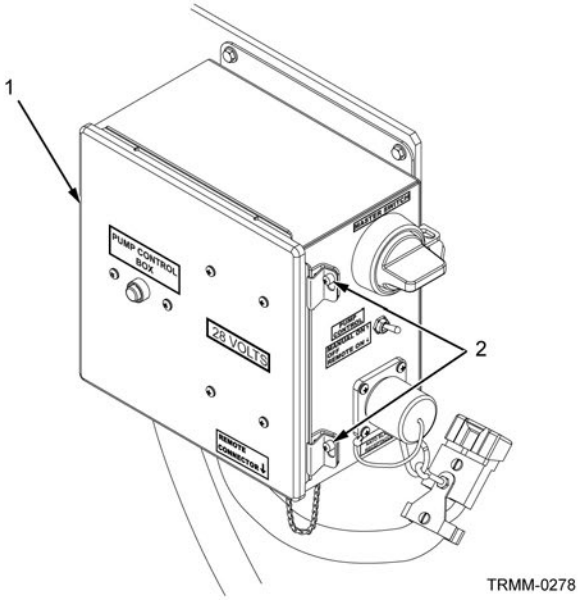


Figure 5. Close Power Control Box Cover.

END OF TASK

FOLLOW-ON MAINTENANCE

Apply power to MFS TRM to verify proper operation (TM 10-4930-371-10).

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
POWER CONTROL BOX PUMP CONTROL TOGGLE SWITCH REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
Fire extinguisher (TM 10-4930-371-10)

Materials/Parts
Wire marker books (WP 0216, Table 1, Item 17)
Power Control Toggle Switch (WP 0193, Figure 47, Item 29)

Personnel Required
Quartermaster and Chemical Equipment Repairer 91J

References
TM 10-4930-371-10
Wiring Schematic

Equipment Condition
MFS TRM grounded (TM 10-4930-371-10)
MFS TRM shut down (TM 10-4930-371-10)

Time to Complete
0.2 Hour(s)

REMOVAL

WARNING

- Remove all jewelry such as rings, ID tags, watches, bracelets, and neck chains. If jewelry or a tool makes contact across an electrical circuit, a direct short could result in instant heating or electrical shock.
- Do not allow the positive and negative cables to make contact with each other or any metal part of the equipment. Failure to comply could result in injury or death to personnel or damage to equipment.

1. Ensure power is disconnected from MFS TRM (TM 10-4930-371-10).
2. Loosen two screws (Figure 1, Item 3) and open power control box cover (Figure 1, Item 1).
3. Unscrew and remove rubber boot (Figure 1, Item 9) from pump control toggle switch (Figure 1, Item 6).
4. Remove hex nut (Figure 1, Item 8) and pull pump control toggle switch (Figure 1, Item 6) with knurled ring (Figure 1, Item 7) from inside power control box (Figure 1, Item 2).

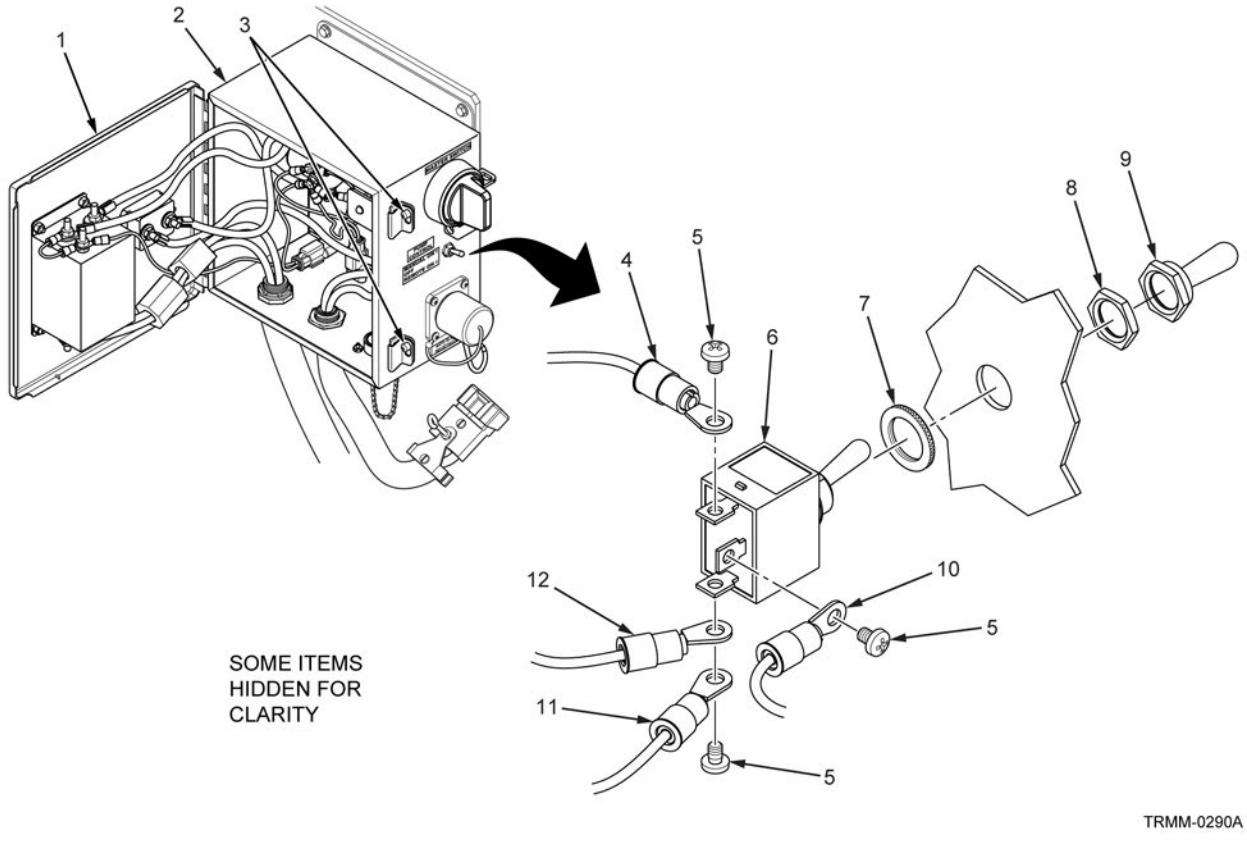


Figure 1. Removing Pump Control Toggle Switch.

REMOVAL - Continued

5. Tag electrical wires (Figure 1, Items 4, 10, 11, and 12) attached to pump control toggle switch (Figure 1, Item 6) to aid in installation.
6. Remove three screws (Figure 1, Item 5) and disconnect electrical wires (Figure 1, Items 4, 10, 11, and 12) from pump control toggle switch (Figure 1, Item 6).

END OF TASK

INSTALLATION

1. Refer to tags and attach electrical wires (Figure 2, Items 2, 8, 9, and 10) to pump control toggle switch (Figure 2, Item 4) and secure with three screws (Figure 2, Item 3).
2. Install pump control toggle switch (Figure 2, Item 4) with knurled ring (Figure 2, Item 5) onto inside of power control box (Figure 2, Item 1) and secure with hex nut (Figure 2, Item 6).

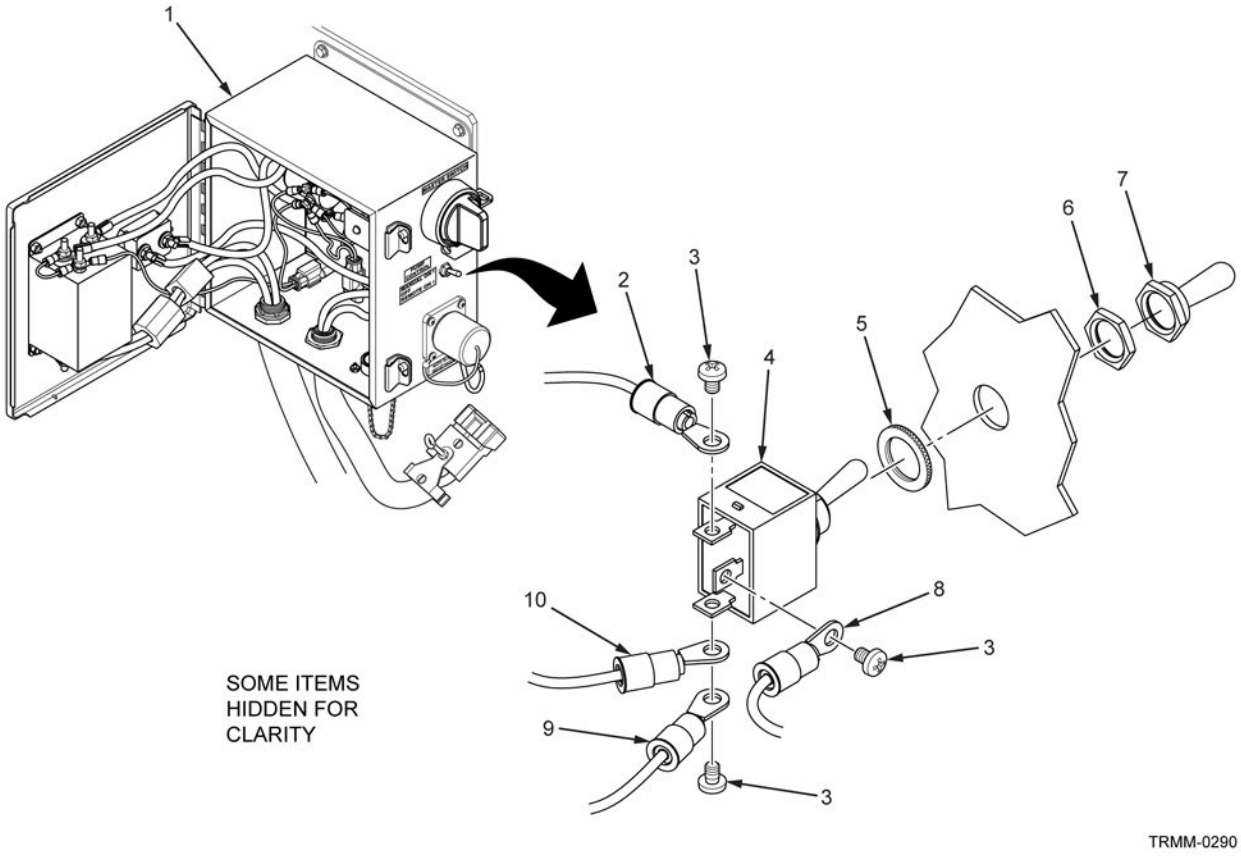


Figure 2. Installing Pump Control Toggle Switch.

3. Prior to installation, inspect rubber boot (Figure 2, Item 7) and replace if damaged.
4. Screw rubber boot (Figure 2, Item 7) onto pump control toggle switch (Figure 2, Item 4) until hand tight.
5. Remove and discard tags.

INSTALLATION - Continued

6. Close power control box cover (Figure 3, Item 1) and secure by tightening two screws (Figure 3, Item 2).

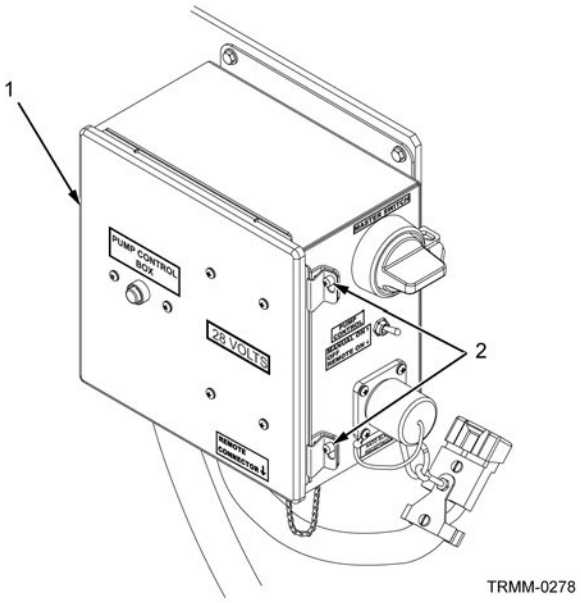


Figure 3. Close Power Control Box Cover.

END OF TASK

FOLLOW-ON MAINTENANCE

Apply power to MFS TRM to verify proper operation (TM 10-4930-371-10).

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
POWER CONTROL BOX RELAY REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)

Materials/Parts
- Wire marker books (WP 0216, Table 1, Item 17)
- Washer, lock Qty: 2 (WP 0193, Figure 47, Item 10)
- Relay 24 Volt (WP 0193, Figure 47, Item 16)

Personnel Required
- Quartermaster and Chemical Equipment Repairer 91J

References
- TM 10-4930-371-10

References (cont.)
- Wiring Schematic
- WP 0113
- WP 0115
- WP 0114

Equipment Condition
- MFS TRM grounded (TM 10-4930-371-10)
- MFS TRM shut down (TM 10-4930-371-10)
- Master switch removed (WP 0113)
- Pump control toggle switch removed (WP 0115)
- NATO slave receptacle removed (WP 0114)

Time to Complete
- 1 Hour(s)

REMOVAL

WARNING

- Remove all jewelry such as rings, ID tags, watches, bracelets, and neck chains. If jewelry or a tool makes contact across an electrical circuit, a direct short could result in instant heating or electrical shock.
- Do not allow the positive and negative cables to make contact with each other or any metal part of the equipment. Failure to comply could result in injury or death to personnel or damage to equipment.

1. Tag electrical wires (Figure 1, Items 3, 4, 6, 7, 8, 11, 12, and 13) attached to relay (Figure 1, Item 5) to aid in installation.

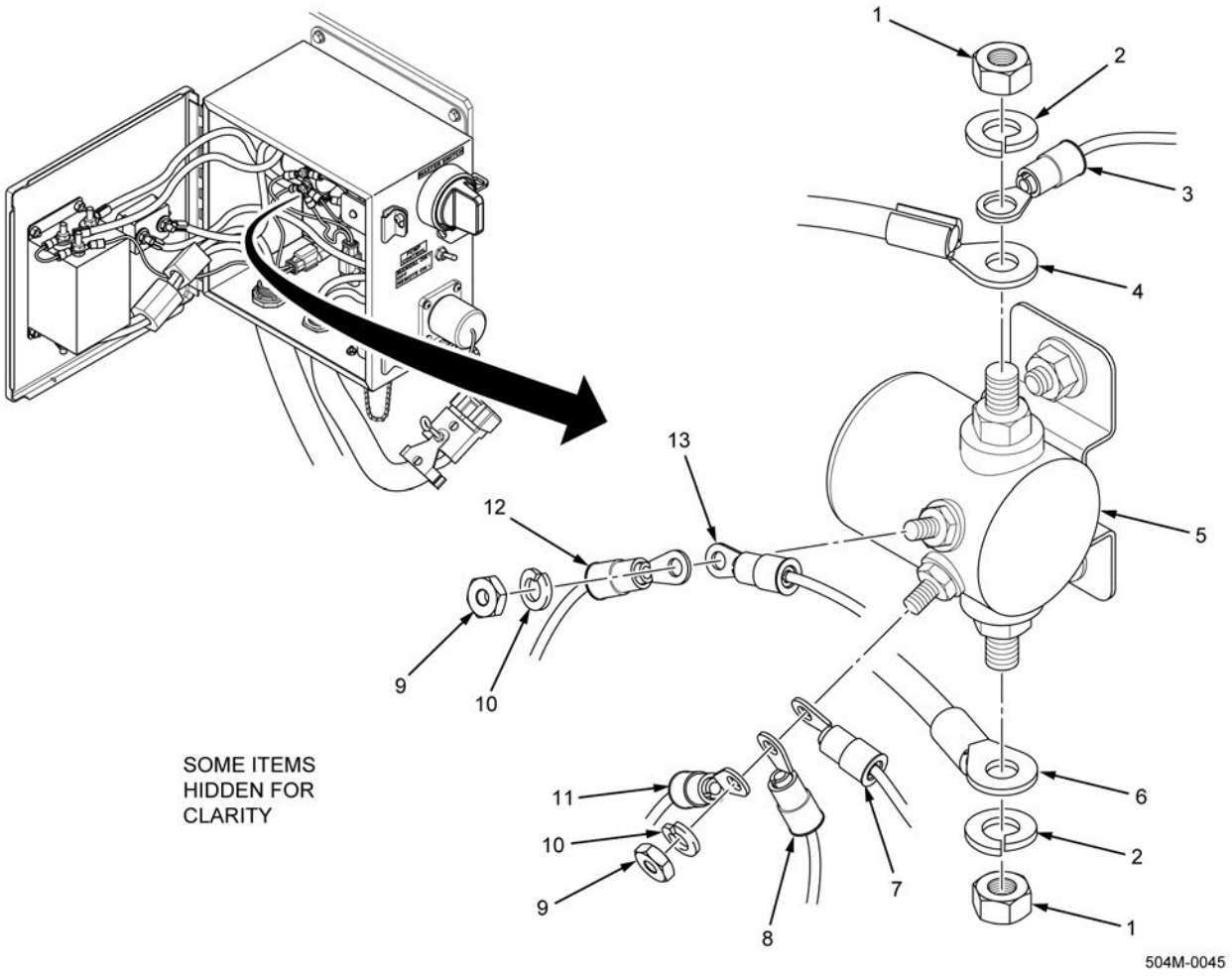


Figure 1. Disconnecting Relay.

REMOVAL - Continued

2. Remove two nuts (Figure 1, Item 9) and two lock washers (Figure 1, Item 10) and disconnect electrical wires (Figure 1, Items 7, 8, 11, 12, and 13) from relay (Figure 1, Item 5). Discard lock washers.
3. Remove two nuts (Figure 1, Item 1) and two lock washers (Figure 1, Item 2) and disconnect electrical wires (Figure 1, Items 3, 4, and 6) from relay (Figure 1, Item 5). Discard lock washers.
4. Remove four screws (Figure 2, Item 1) and lean back panel (Figure 2, Item 4) outwards to access the reverse side of back panel (Figure 2, Item 4).

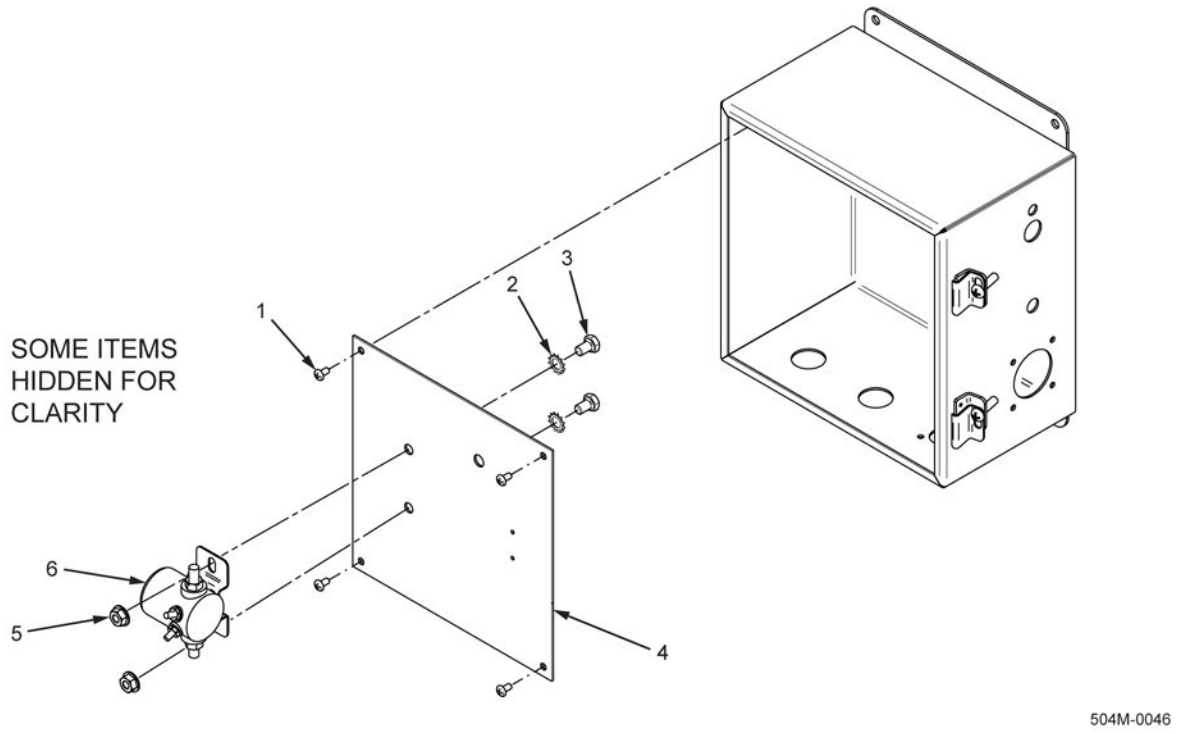


Figure 2. Replacing Relay.

5. Remove two nuts (Figure 2, Item 5), bolts (Figure 2, Item 3) and external tooth lock washers (Figure 2, Item 2), and remove relay (Figure 2, Item 6) from back panel (Figure 2, Item 4). Discard external tooth lock washers.

END OF TASK

INSTALLATION

1. Install relay (Figure 2, Item 6) onto back panel (Figure 2, Item 4), and secure with two bolts (Figure 2, Item 3), new external tooth lock washers (Figure 2, Item 2) and nuts (Figure 2, Item 5).
2. Lean back panel (Figure 2, Item 4) inwards and secure with four screws (Figure 2, Item 1).

INSTALLATION - Continued

3. Refer to tags and attach electrical wires (Figure 3, Items 3, 4, and 6) to relay (Figure 3, Item 5) and secure with two new lock washers (Figure 3, Item 2) and two nuts (Figure 3, Item 1).

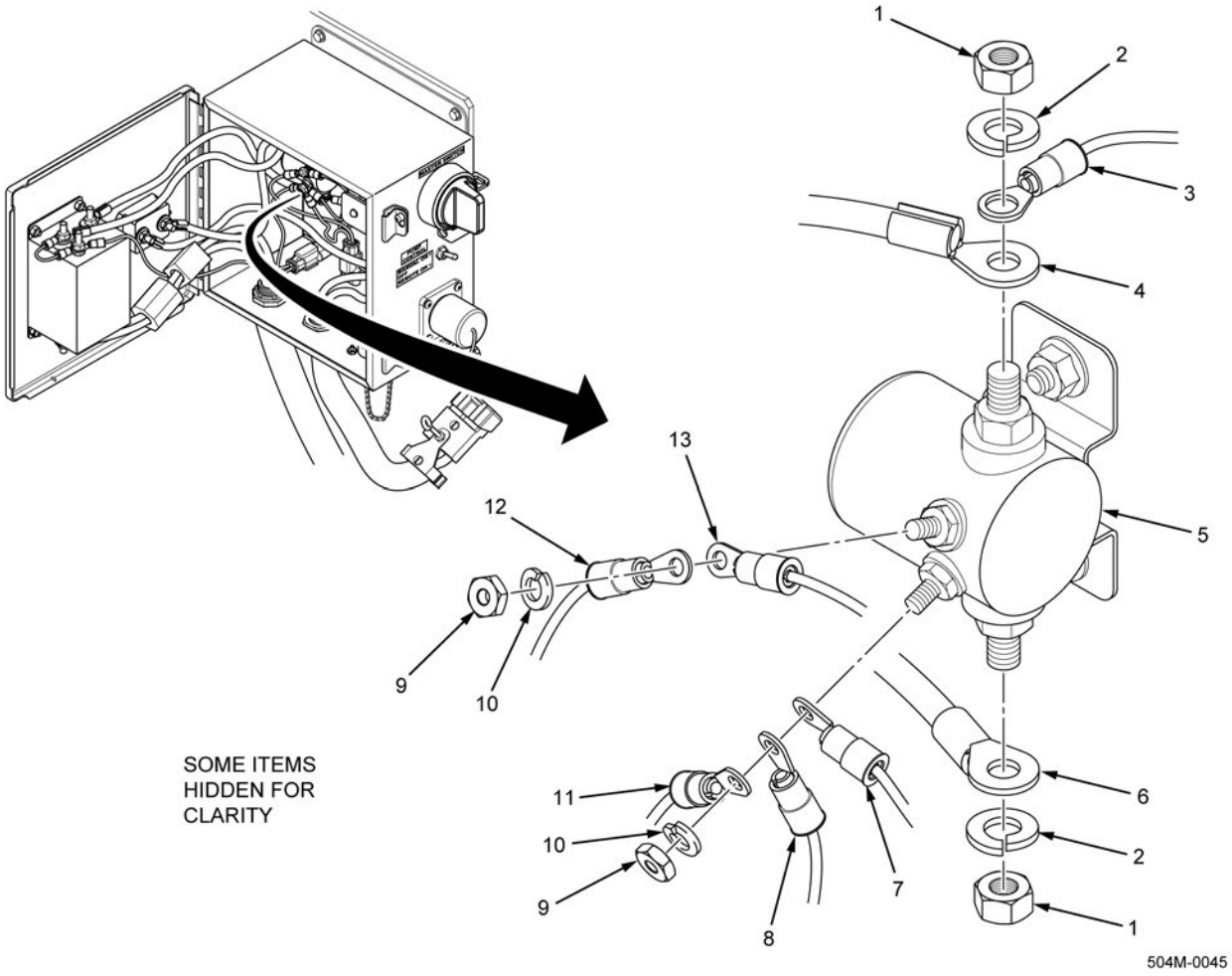


Figure 3. Connecting Relay.

4. Refer to tags and attach electrical wires (Figure 3, Items 7, 8, 11, 12, and 13) to relay (Figure 3, Item 5) and secure with two new lock washers (Figure 3, Item 10) and nuts (Figure 3, Item 9).
5. Remove and discard tags.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install master switch (WP 0113).
2. Install pump control toggle switch (WP 0115).
3. Install NATO slave receptacle (WP 0114).

FOLLOW-ON MAINTENANCE - Continued

4. Apply power to MFS TRM to verify proper operation (TM 10-4930-371-10).

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
POWER CONTROL BOX REMOTE CONNECTOR REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
Fire extinguisher (TM 10-4930-371-10)

Materials/Parts
Wire marker books (WP 0216, Table 1, Item 17)
Nut, Self-Locking, Hexagon (LOCKNUTS) Qty: 4 (WP 0193, Figure 47, Item 36)
Remote Connector Assembly (WP 0193, Figure 47, Item 35)

Personnel Required
Quartermaster and Chemical Equipment Repairer 91J

References
TM 10-4930-371-10
Wiring Schematic

Equipment Condition
MFS TRM grounded (TM 10-4930-371-10)
MFS TRM shut down (TM 10-4930-371-10)

Time to Complete
0.2 Hour(s)

REMOVAL

WARNING

- Remove all jewelry such as rings, ID tags, watches, bracelets, and neck chains. If jewelry or a tool makes contact across an electrical circuit, a direct short could result in instant heating or electrical shock.
- Do not allow the positive and negative cables to make contact with each other or any metal part of the equipment. Failure to comply could result in injury or death to personnel or damage to equipment.

1. Ensure power is disconnected from MFS TRM (TM 10-4930-371-10).
2. Loosen two screws (Figure 1, Item 1) and open power control box cover (Figure 1, Item 2).

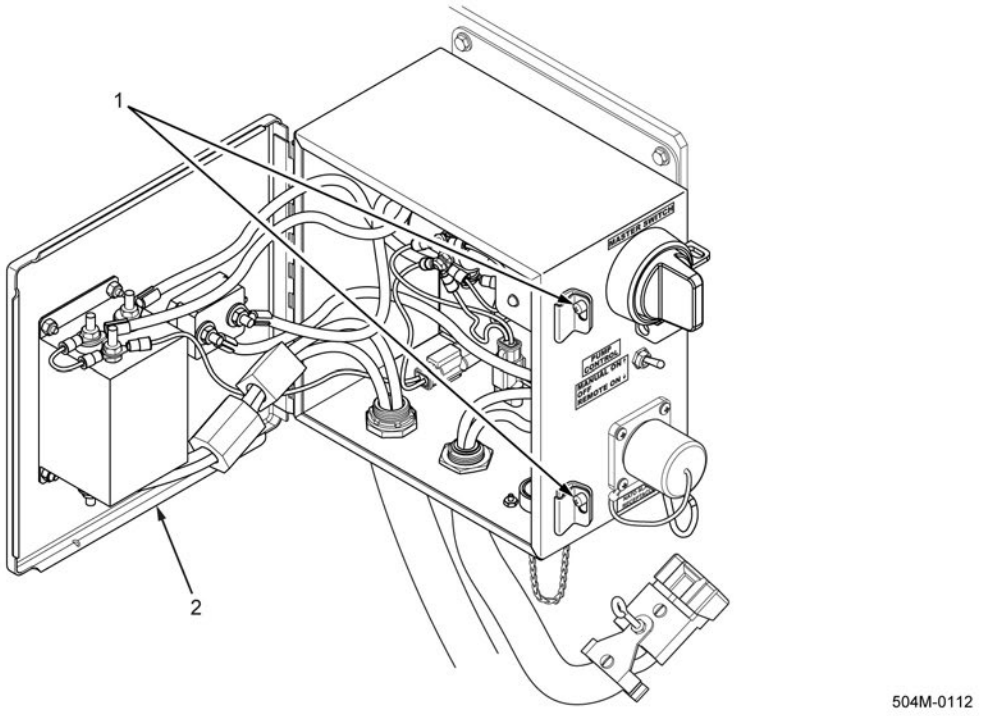


Figure 1. Removing Remote Connector.

3. Tag three electrical wires (Figure 2, Items 1, 4, and 5) between remote connector and pump control toggle switch (Figure 2, Item 3).
4. Remove two screws (Figure 2, Item 2).

REMOVAL - Continued

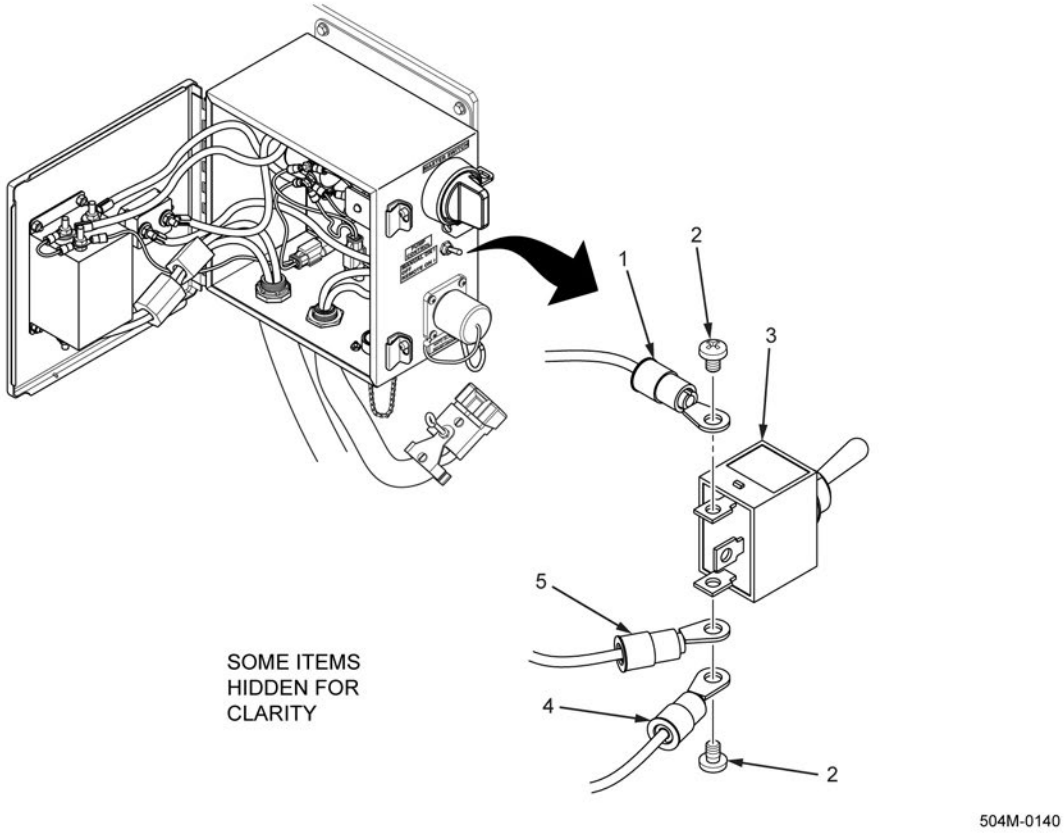


Figure 2. Removing Remote Connector.

5. Remove screw (Figure 3, Item 8) and locknut (Figure 3, Item 4) and detach chain (Figure 3, Item 6) from remote connector (Figure 3, Item 3). Discard locknut.

REMOVAL - Continued

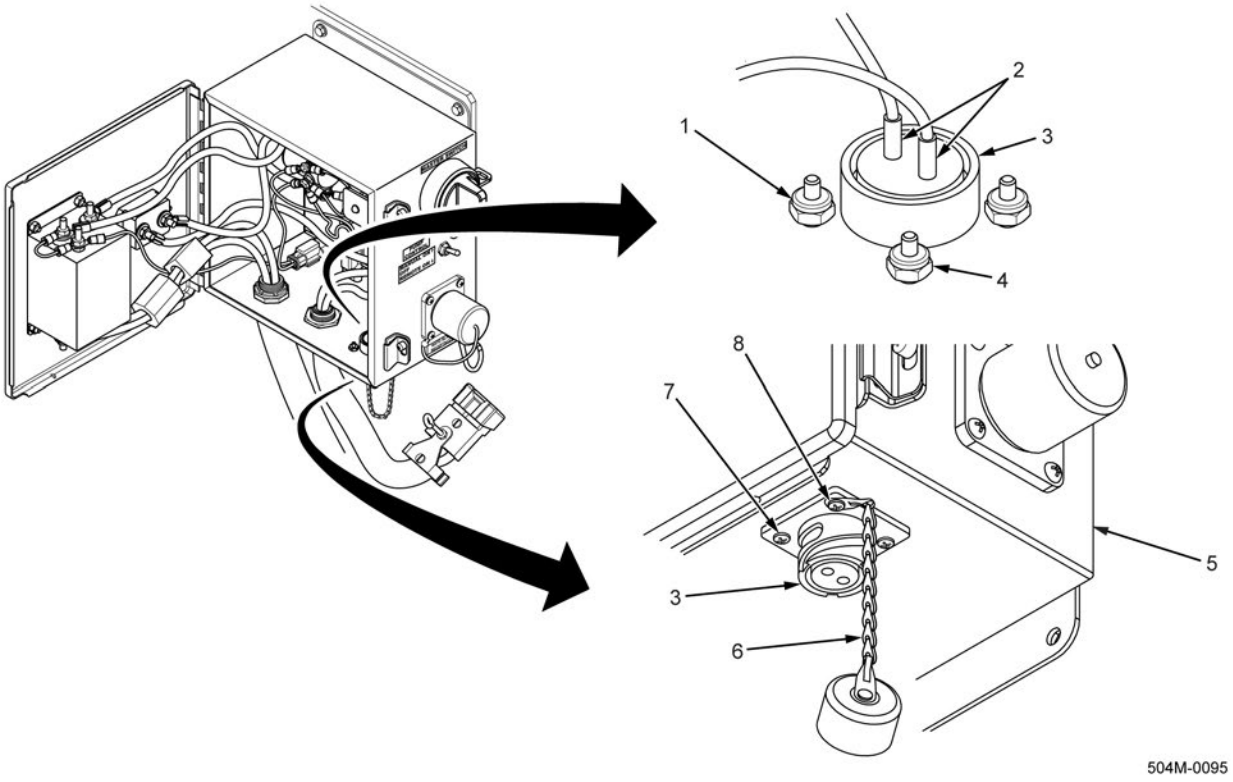


Figure 3. Removing Remote Connector.

6. Remove three screws (Figure 3, Item 7) and locknuts (Figure 3, Item 1). Discard locknuts.
7. Remove remote connector (Figure 3, Item 3) with attached electrical wires (Figure 3, Item 2) from outside power control box (Figure 3, Item 5).

END OF TASK

INSTALLATION

1. Transfer tags from electrical wires (Figure 4, Item 2) on faulty remote connector to corresponding wires on new remote connector (Figure 4, Item 3).

INSTALLATION - Continued

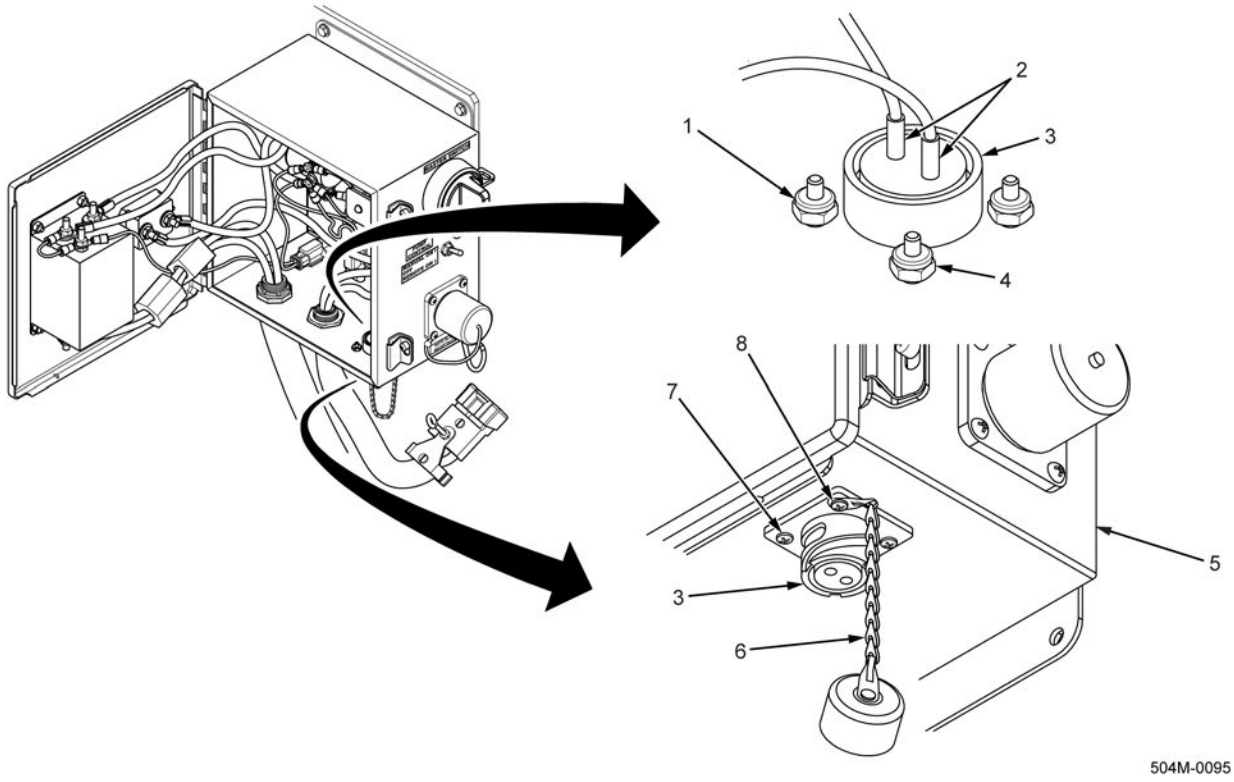


Figure 4. Installing Remote Connector.

2. Install remote connector (Figure 4, Item 3) onto outside of power control box (Figure 4, Item 5) and secure with three screws (Figure 4, Item 7) and new locknuts (Figure 4, Item 1).
3. Attach chain (Figure 4, Item 6) and secure with screw (Figure 4, Item 8) and new locknut (Figure 4, Item 4).
4. Install three electrical wires (Figure 5, Items 1, 4, and 5) between remote connector and pump control toggle switch (Figure 5, Item 3).
5. Install two screws (Figure 5, Item 2).

INSTALLATION - Continued

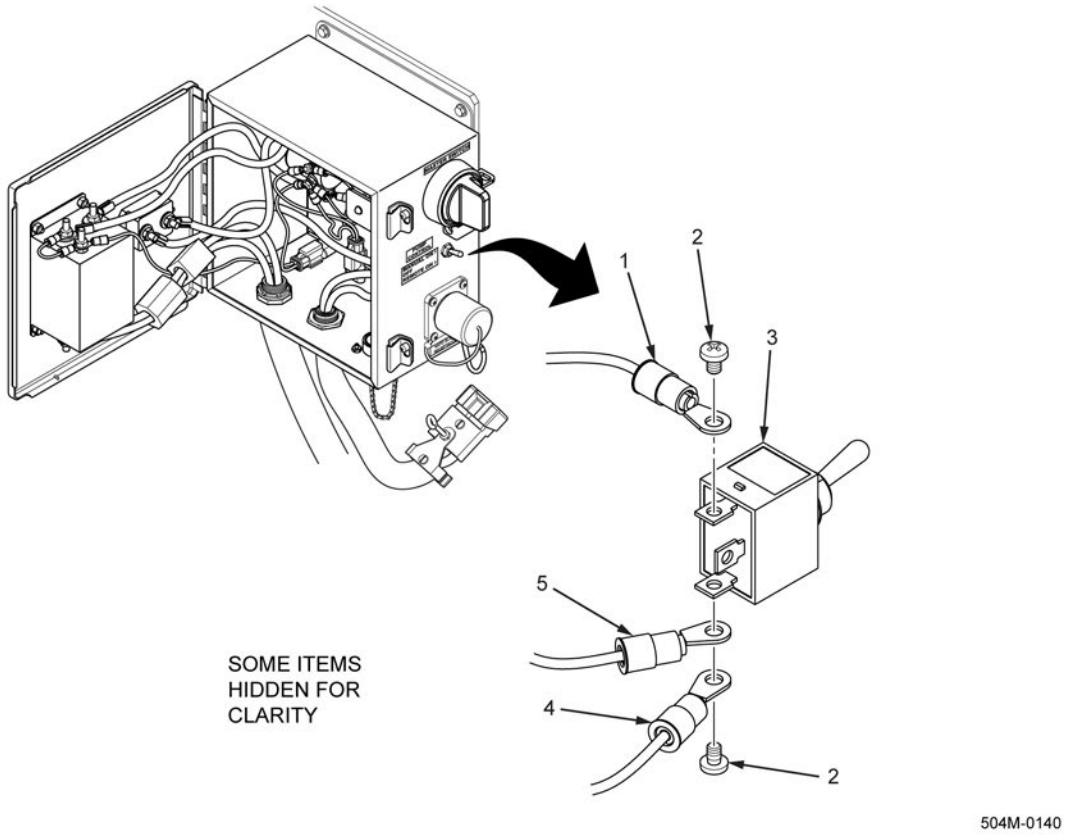


Figure 5. Installing Remote Connector.

6. Remove and discard tags.
7. Close power control box cover (Figure 6, Item 1) and secure by tightening two screws (Figure 6, Item 2).

INSTALLATION - Continued

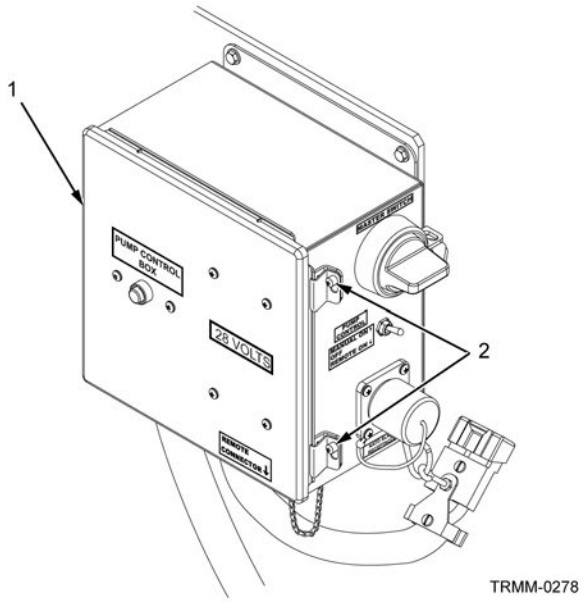


Figure 6. Close Power Control Box Cover.

END OF TASK

FOLLOW-ON MAINTENANCE

Apply power to MFS TRM to verify proper operation (TM 10-4930-371-10).

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
TEST LIGHT LED ASSEMBLY REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
Fire extinguisher (TM 10-4930-371-10)

Materials/Parts
Wire marker books (WP 0216, Table 1, Item 17)
Washer, lock (WP 0193, Figure 47, Item 34)
LED Test Light Assembly (WP 0193, Figure 47, Item 13)

Personnel Required
Quartermaster and Chemical Equipment Repairer 91J

References
TM 10-4930-371-10
Wiring Schematic

Equipment Condition
MFS TRM grounded (TM 10-4930-371-10)
MFS TRM shut down (TM 10-4930-371-10)

Time to Complete
0.3 Hour(s)

REMOVAL

WARNING

- Remove all jewelry such as rings, ID tags, watches, bracelets, and neck chains. If jewelry or a tool makes contact across an electrical circuit, a direct short could result in instant heating or electrical shock.
- Do not allow the positive and negative cables to make contact with each other or any metal part of the equipment. Failure to comply could result in injury or death to personnel or damage to equipment.

1. Ensure power is disconnected from MFS TRM (TM 10-4930-371-10).
2. Loosen two screws (Figure 1, Item 2) and open power control box cover (Figure 1, Item 1).
3. Tag electrical wires (Figure 1, Items 6 and 7) attached to test light LED assembly (Figure 1, Item 3) to aid in installation.

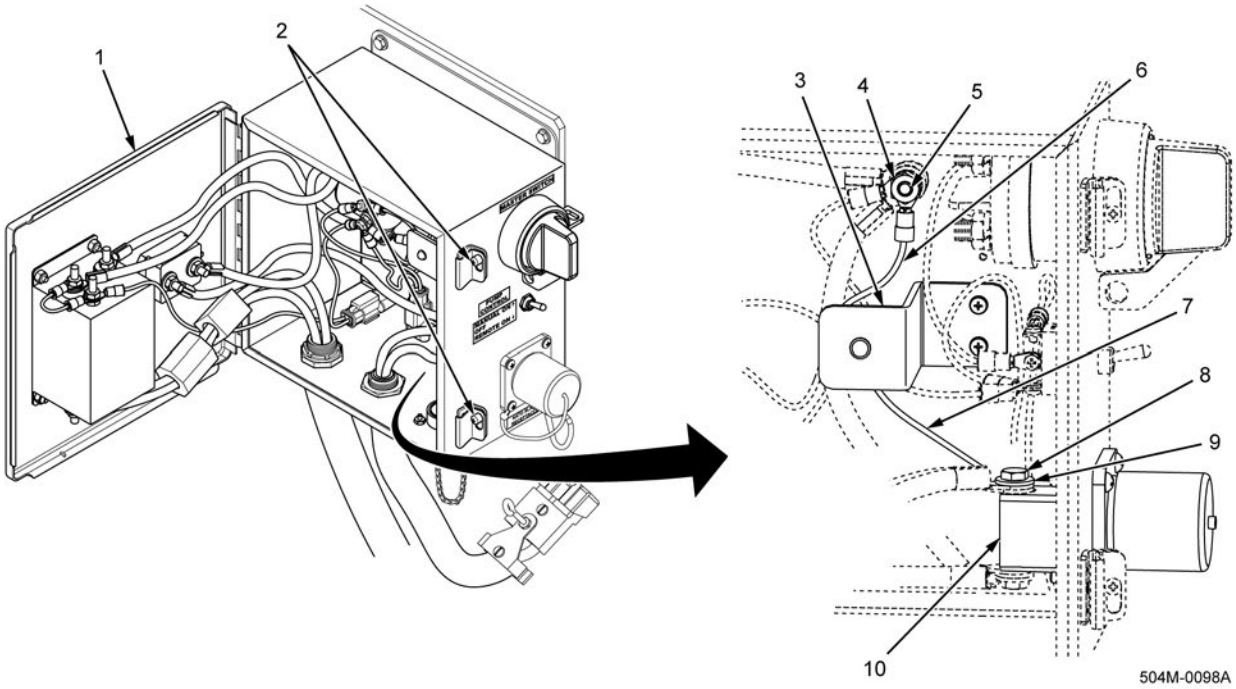


Figure 1. Removing Test Light LED Assembly.

4. Remove nut (Figure 1, Item 4), bolt (Figure 1, Item 8), lock washer (Figure 1, Item 9) and disconnect electrical wires (Figure 1, Items 6 and 7) from ground lug (Figure 1, Item 5) and NATO slave receptacle (Figure 1, Item 10). Discard lock washer.
5. Remove test light LED assembly (Figure 1, Item 3) by removing existing screws.

END OF TASK

INSTALLATION

1. Attach LED assembly bracket (Figure 1, Items 3) to power control box with existing screws.
2. Transfer tags from electrical wires (Figure 1, Items 6 and 7) on faulty test light LED assembly to corresponding wires on new test light LED assembly (Figure 1, Item 3).
3. Refer to tags and attach electrical wire (Figure 1, Item 6) to ground lug (Figure 1, Item 5) and secure with nut (Figure 1, Item 4).
4. Refer to tags and attach electrical wire (Figure 1, Item 7) to NATO slave receptacle (Figure 1, Item 10) and secure with new lock washer (Figure 1, Item 9) and bolt (Figure 1, Item 8).
5. Remove and discard tags.
6. Close power control box cover (Figure 2, Item 1) and secure by tightening two screws (Figure 2, Item 2).

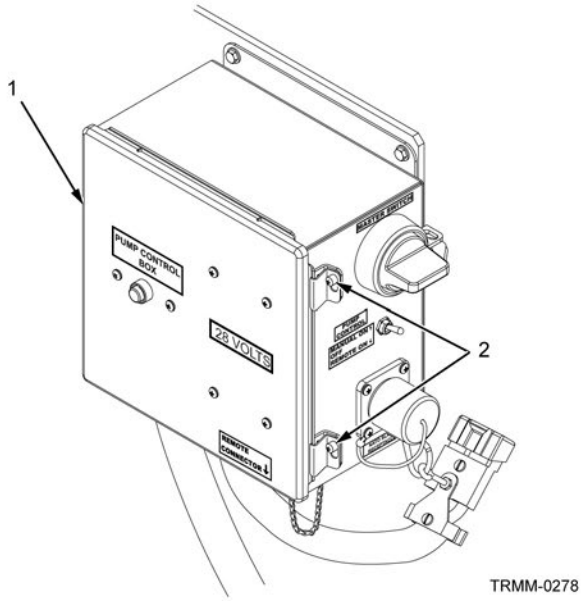


Figure 2. Close Power Control Box Cover.

END OF TASK

FOLLOW-ON MAINTENANCE

Apply power to MFS TRM to verify proper operation (TM 10-4930-371-10).

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
POWER CONTROL BOX WIRING REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)

Materials/Parts
- Cable ties Qty: 2 (WP 0216, Table 1, Item 14)
- Wire marker books (WP 0216, Table 1, Item 17)
- Hex nut with tooth washer Qty: 2 (WP 0193, Figure 47, Item 12)
- Washer, lock internal tooth Qty: 4 (WP 0193, Figure 47, Item 24)
- Washer, lock internal tooth Qty: 2 (WP 0193, Figure 47, Item 13)
- Washer, lock internal tooth Qty: 2 (WP 0193, Figure 47, Item 11)
- Wire, EMI channel filter to gnd (WP 0194, Figure 48, Item 2)
- Wire, shunt (WP 0194, Figure 48, Item 3)
- Wire, circuit breaker to positive NATO slave receptacle (WP 0194, Figure 48, Item 4)
- Wire, negative NATO slave receptacle to gnd (WP 0194, Figure 48, Item 5)
- Electric motor power cable (WP 0194, Figure 48, Item 6)
- NATO power connector pigtail (WP 0194, Figure 48, Item 7)
- Wire, relay to power control toggle switch (WP 0194, Figure 48, Item 8)

Materials/Parts (cont.)
- Wire, master switch to power control toggle switch (WP 0194, Figure 48, Item 9)
- Wire, relay to gnd (WP 0194, Figure 48, Item 10)
- Wire, relay to master switch (WP 0194, Figure 48, Item 11)
- Wire, relay to EMI channel filter (WP 0194, Figure 48, Item 12)
- Wire, circuit breaker to relay (WP 0194, Figure 48, Item 13)

Personnel Required
- Quartermaster and Chemical Equipment Repairer 91J

References
- TM 10-4930-371-10
- Wiring Schematic

Equipment Condition
- MFS TRM grounded (TM 10-4930-371-10)
- MFS TRM shut down (TM 10-4930-371-10)

Time to Complete
- 1.7 Hour(s)

WARNING

- Remove all jewelry such as rings, ID tags, watches, bracelets, and neck chains. If jewelry or a tool makes contact across an electrical circuit, a direct short could result in instant heating or electrical shock.
- Do not allow the positive and negative cables to make contact with each other or any metal part of the equipment. Failure to comply could result in injury or death to personnel or damage to equipment.

NOTE

Note orientation of hardware and components to aid in installation.

OPEN POWER CONTROL BOX COVER

Loosen two screws (Figure 1, Item 2) and open power control box cover (Figure 1, Item 1).

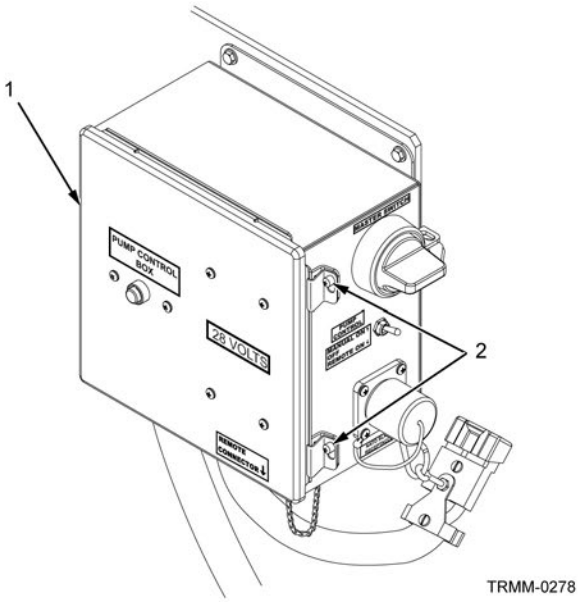


Figure 1. Opening and Closing Power Control Box Cover.

END OF TASK

CLOSE POWER CONTROL BOX COVER

Close power control box cover (Figure 1, Item 1) and secure by tightening two screws (Figure 1, Item 2).

END OF TASK

NATO SLAVE RECEPTACLE POSITIVE (RED) WIRE REMOVAL

1. Ensure power is disconnected from MFS TRM (TM 10-4930-371-10).
2. Open Power Control Box Cover (Open Power Control Box Cover task in this WP).
3. Tag the following electrical wires:
   a. Red wire (Figure 2, Item 1) to LED assembly
   b. Positive (red) wire (Figure 2, Item 7) to 70A circuit breaker
   c. Positive (red) wire (Figure 2, Item 2) to NATO slave receptacle
4. Remove bolt (Figure 2, Item 3) and lockwasher (Figure 2, Item 4), and disconnect electrical wires (Figure 2, Items 1 and 2) and NATO slave receptacle positive (red) wire (Figure 2, Item 7) from NATO slave receptacle (Figure 2, Item 5). Discard lockwasher.
5. Remove hex nut with tooth washer (Figure 2, Item 6) and disconnect NATO slave receptacle positive (red) wire (Figure 2, Item 7) from 70A circuit breaker (Figure 2, Item 8). Discard lockwasher.

END OF TASK

NATO SLAVE RECEPTACLE POSITIVE (RED) WIRE INSTALLATION

1. Attach new NATO slave receptacle positive (red) wire (Figure 2, Item 7) to 70A circuit breaker (Figure 2, Item 8) and secure with new hex nut with tooth washer (Figure 2, Item 6).

NATO SLAVE RECEPTACLE POSITIVE (RED) WIRE INSTALLATION - Continued

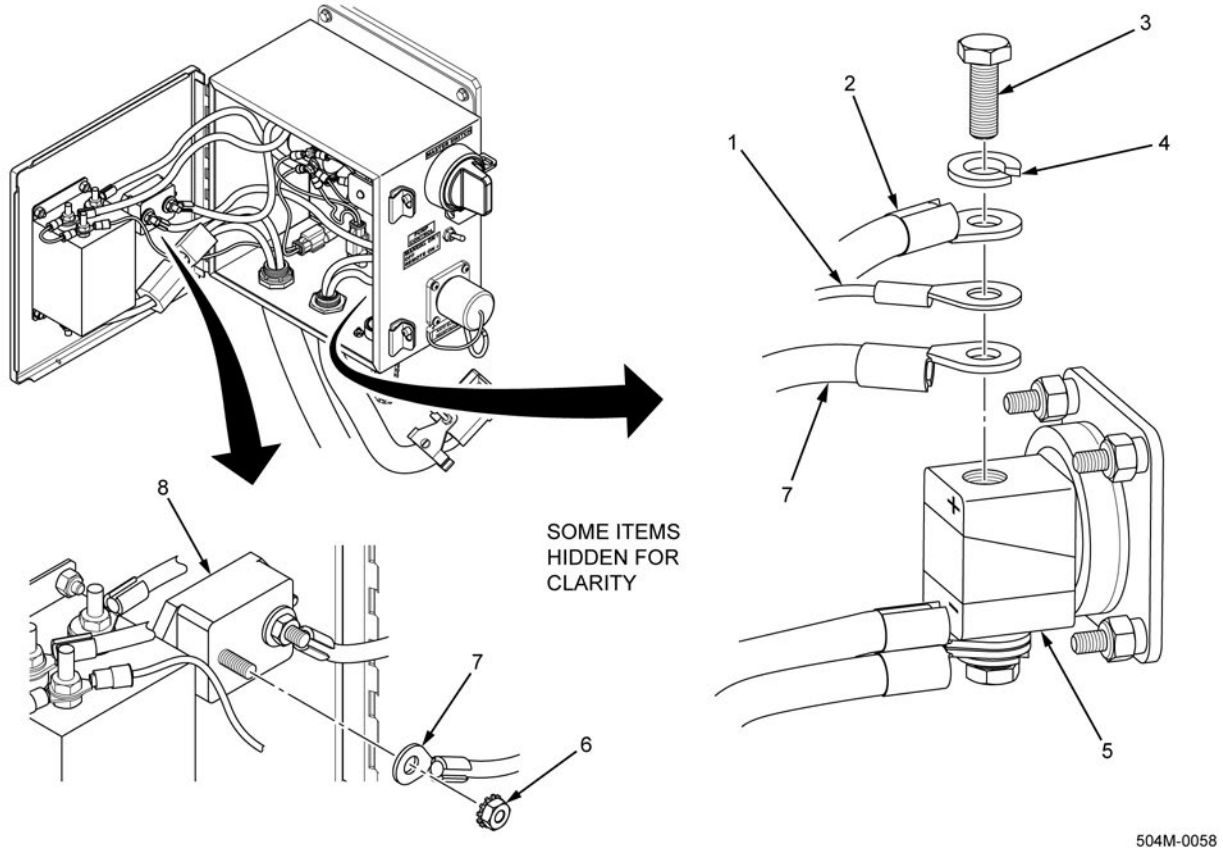


Figure 2. NATO Slave Receptacle Positive (Red) Wire.

2. Refer to tags and attach new NATO slave receptacle positive (red) wire (Figure 2, Item 7) and electrical wires (Figure 2, Items 1 and 2) to NATO slave receptacle (Figure 2, Item 5), and secure with new lockwasher (Figure 2, Item 4) and bolt (Figure 2, Item 3).
3. Remove and discard tags.
4. Close Power Control Box Cover (Close Power Control Box Cover task in this WP).

END OF TASK

NATO SLAVE RECEPTACLE GROUND (BLACK) WIRE REMOVAL

1. Ensure power is disconnected from MFS TRM (TM 10-4930-371-10).
2. Open Power Control Box Cover (Open Power Control Box Cover task in this WP).
3. Tag the following electrical wires and NATO slave receptacle ground (black) wire attached to NATO slave receptacle to aid in installation.
   a. At NATO slave receptacle (Figure 3, Item 2):
      (1) Ground (black) wire to pigtail (Figure 3, Item 5)
      (2) Ground (black) wire (Figure 3, Item 1)

NATO SLAVE RECEPTACLE GROUND (BLACK) WIRE REMOVAL - Continued

b. At ground lug (Figure 3, Item 6):
   (1) Ground (black) wire (Figure 3, Item 1)
   (2) Ground (black) wire to EMI channel filter
   (3) White wire to LED assembly
   (4) Ground (black) wire to relay

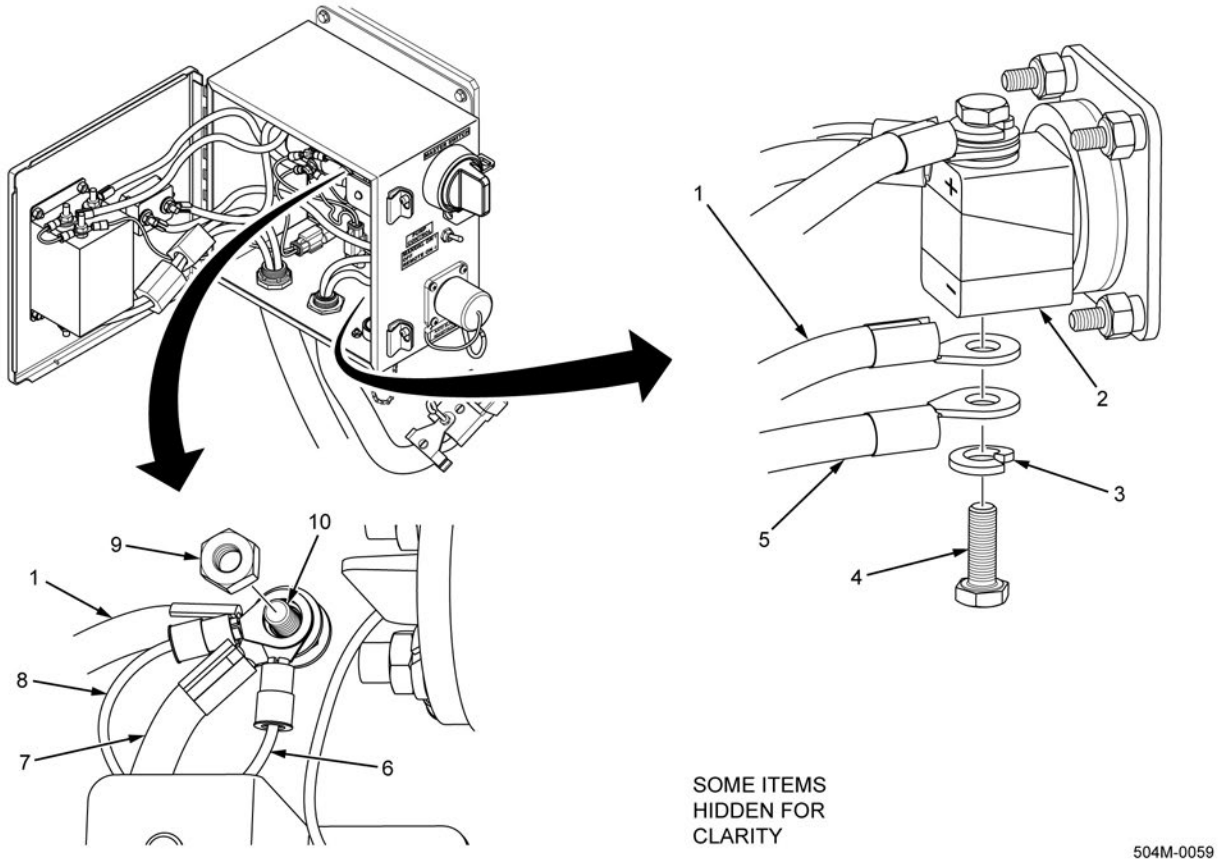


Figure 3. NATO Slave Receptacle Ground (Black) Wire.

4. Remove bolt (Figure 3, Item 4) and lockwasher (Figure 3, Item 3), and disconnect electrical wire (Figure 3, Item 5) and NATO slave receptacle ground (black) wire (Figure 3, Item 1) from NATO slave receptacle (Figure 3, Item 2). Discard lock washer.
5. Remove nut (Figure 3, Item 9) and disconnect NATO slave receptacle ground (black) wire (Figure 3, Item 1) from ground lug (Figure 3, Item 10).

END OF TASK

NATO SLAVE RECEPTACLE GROUND (BLACK) WIRE INSTALLATION

1. Attach new NATO slave receptacle ground (black) wire (Figure 3, Item 1) and electrical wires (Figure 3, Items 6, 7, and 8) to ground lug (Figure 3, Item 10) and secure with nut (Figure 3, Item 9).

NATO SLAVE RECEPTACLE GROUND (BLACK) WIRE INSTALLATION - Continued

2. Refer to tags and connect new NATO slave receptacle ground (black) wire (Figure 3, Item 1) and electrical wire (Figure 3, Item 5) to NATO slave receptacle (Figure 3, Item 2), and secure with new lock washer (Figure 3, Item 3) and bolt (Figure 3, Item 4).
3. Remove and discard tags.
4. Close Power Control Box Cover (Close Power Control Box Cover task in this WP).

END OF TASK

70A CIRCUIT BREAKER TO RELAY (RED) WIRE REMOVAL

1. Ensure power is disconnected from MFS TRM (TM 10-4930-371-10).
2. Open Power Control Box Cover (Open Power Control Box Cover task in this WP).
3. Tag the following electrical wires at the relay (Figure 4, Item 5):
   a. Positive (red) wire (Figure 4, Item 1) to 70A circuit breaker
   b. Positive (red) wire (Figure 4, Item 2) to master switch

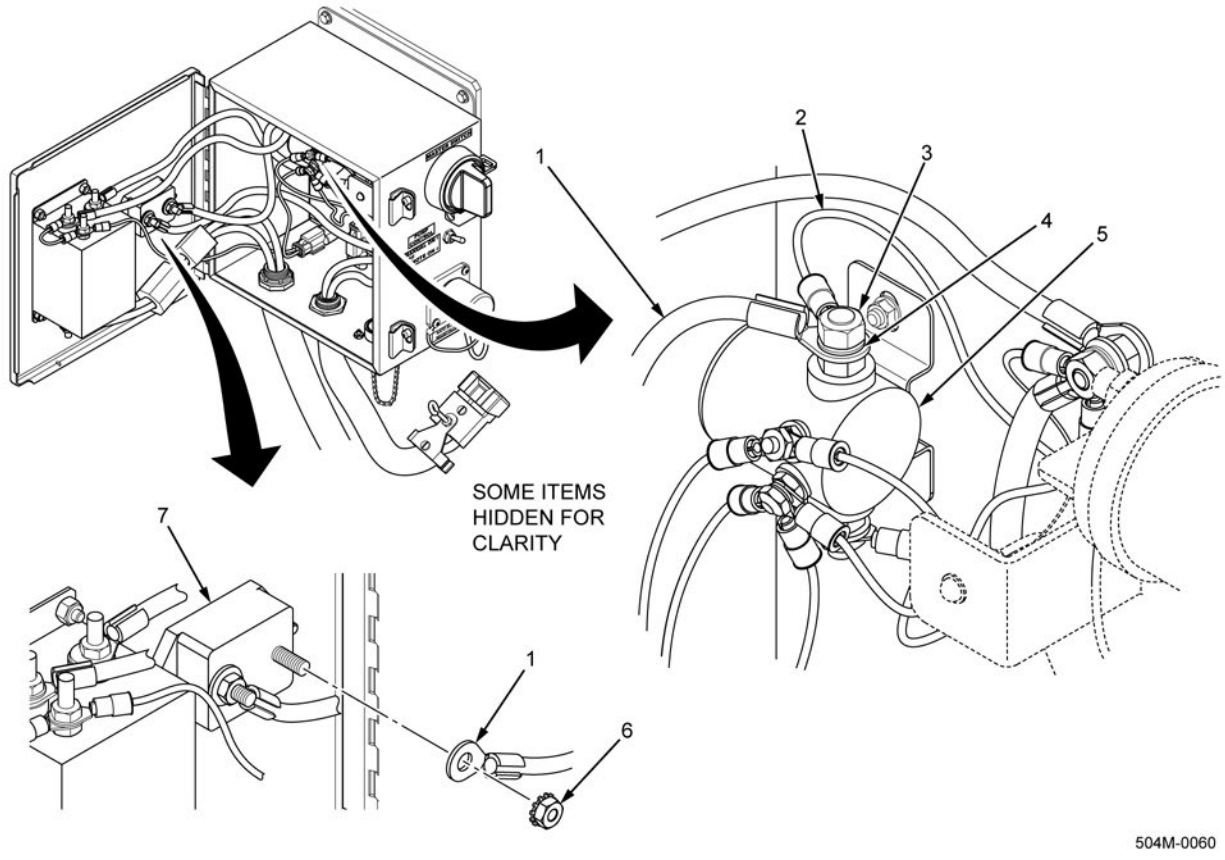


Figure 4. 70A Circuit Breaker to Relay (Red) Wire.

70A CIRCUIT BREAKER TO RELAY (RED) WIRE REMOVAL - Continued

4. Remove nut (Figure 4, Item 3) and lockwasher (Figure 4, Item 4) and disconnect 70A circuit breaker to relay (red) wire (Figure 4, Item 1) and electrical wire (Figure 4, Item 2) from relay (Figure 4, Item 5). Discard lockwasher.
5. Remove hex nut with tooth washer (Figure 4, Item 6) and disconnect 70A circuit breaker to relay (red) wire (Figure 4, Item 1) from 70A circuit breaker (Figure 4, Item 7). Discard lockwasher.

END OF TASK

70A CIRCUIT BREAKER TO RELAY (RED) WIRE INSTALLATION

1. Attach new 70A circuit breaker to relay (red) wire (Figure 4, Item 1) to 70A circuit breaker (Figure 4, Item 7) and secure with new hex nut with tooth washer (Figure 4, Item 6).
2. Refer to tags and attach electrical wire (Figure 4, Item 2) and new 70A circuit breaker to relay (red) wire (Figure 4, Item 1) to relay (Figure 4, Item 5) and secure with new lockwasher (Figure 4, Item 4) and nut (Figure 4, Item 3).
3. Remove and discard tags.
4. Close Power Control Box Cover (Close Power Control Box Cover task in this WP).

END OF TASK

RELAY TO MASTER SWITCH (RED) WIRE REMOVAL

1. Ensure power is disconnected from MFS TRM (TM 10-4930-371-10).
2. Open Power Control Box Cover (Open Power Control Box Cover task in this WP).
3. Tag the following electrical wires at relay (Figure 5, Item 6):
   a. Positive (red) wire (Figure 5, Item 7)
   b. Positive (red) wire (Figure 5, Item 8) to master switch

RELAY TO MASTER SWITCH (RED) WIRE REMOVAL - Continued

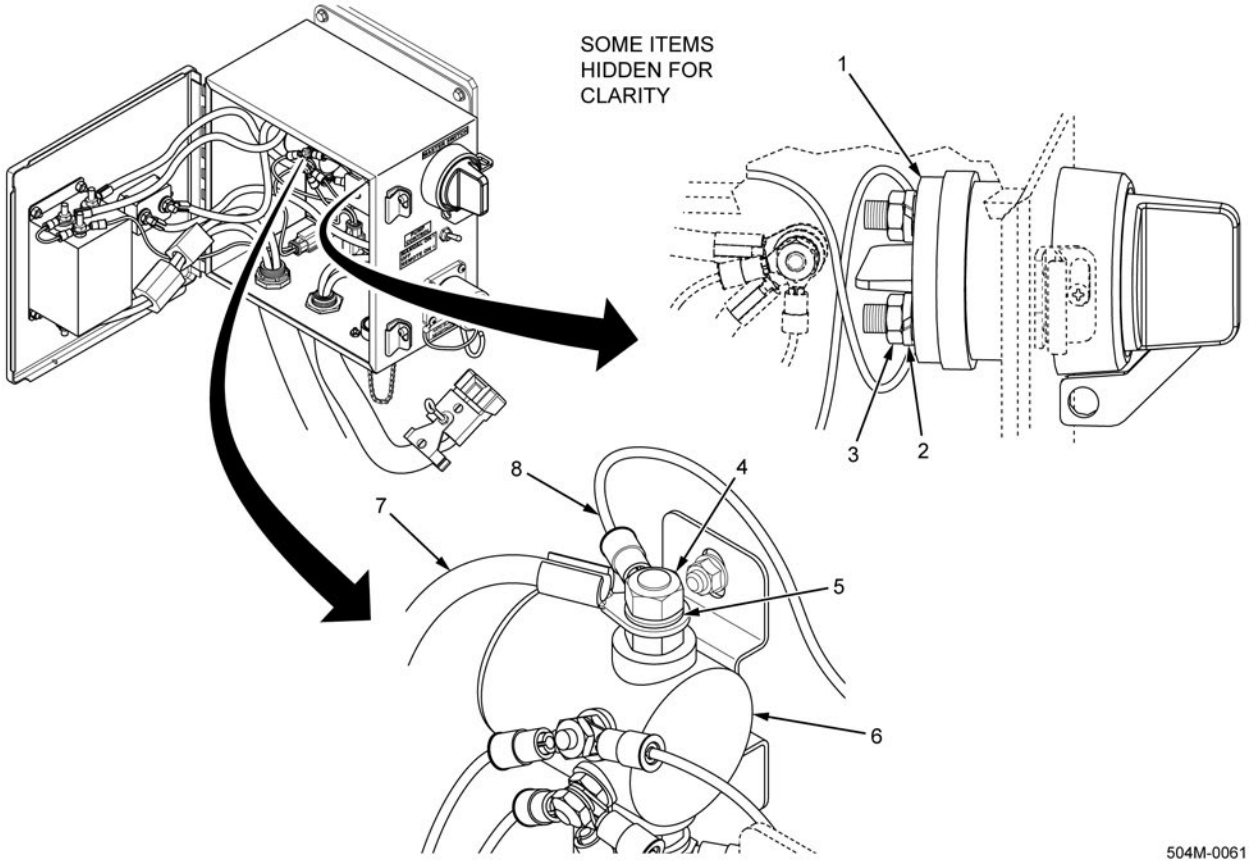


Figure 5. Relay to Master Switch (Red) Wire.

4. Remove nut (Figure 5, Item 4) and lockwasher (Figure 5, Item 5) and disconnect electrical wire (Figure 5, Item 7) and relay to master switch (red) wire (Figure 5, Item 8) from relay (Figure 5, Item 6). Discard lockwasher.
5. Remove nut (Figure 5, Item 3) and lockwasher (Figure 5, Item 2) and disconnect relay to master switch (red) wire (Figure 5, Item 8) from master switch (Figure 5, Item 1). Discard lockwasher.

END OF TASK

RELAY TO MASTER SWITCH (RED) WIRE INSTALLATION

1. Refer to tags and attach new relay to master switch (red) wire (Figure 5, Item 8) and electrical wire (Figure 5, Item 7) to relay (Figure 5, Item 6), and secure with new lockwasher (Figure 5, Item 5) and nut (Figure 5, Item 4).
2. Attach new relay to master switch (red) wire (Figure 5, Item 8) to master switch (Figure 5, Item 1) and secure with new lockwasher (Figure 5, Item 2) and nut (Figure 5, Item 3).
3. Remove and discard tags.
4. Close Power Control Box Cover (Close Power Control Box Cover task in this WP).

END OF TASK

MASTER SWITCH TO PUMP CONTROL TOGGLE SWITCH (RED) WIRE REMOVAL

1. Ensure power is disconnected from MFS TRM (TM 10-4930-371-10).
2. Open Power Control Box Cover (Open Power Control Box Cover task in this WP).
3. Remove nut (Figure 6, Item 1) and lockwasher (Figure 6, Item 2) and disconnect master switch to pump control toggle switch (red) wire (Figure 6, Item 4) from master switch (Figure 6, Item 3).

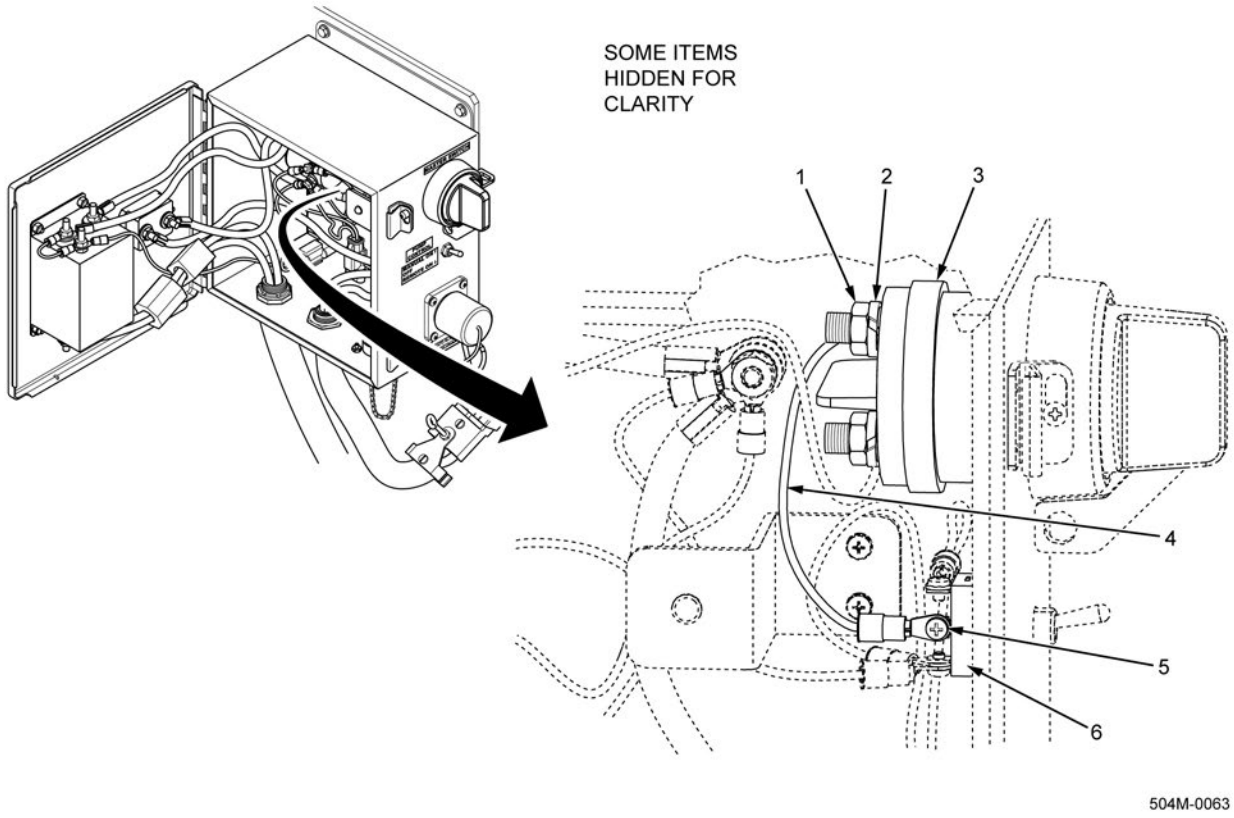


Figure 6. Master Switch to Pump Control Toggle Switch (Red) Wire.

4. Remove screw (Figure 6, Item 5) and disconnect master switch to pump control toggle switch (red) wire (Figure 6, Item 4) from pump control toggle switch (Figure 6, Item 6).

END OF TASK

MASTER SWITCH TO PUMP CONTROL TOGGLE SWITCH (RED) WIRE INSTALLATION

1. Attach new master switch to pump control toggle switch (red) wire (Figure 6, Item 4) to pump control toggle switch (Figure 6, Item 6) and secure with screw (Figure 6, Item 5).
2. Attach new master switch to pump control toggle switch (red) wire (Figure 6, Item 4) to master switch (Figure 6, Item 3) and secure with new lockwasher (Figure 6, Item 2) and nut (Figure 6, Item 1).
3. Close Power Control Box Cover (Close Power Control Box Cover task in this WP).

END OF TASK

PUMP CONTROL TOGGLE SWITCH TO RELAY (WHITE) WIRE REMOVAL

1. Ensure power is disconnected from MFS TRM (TM 10-4930-371-10).
2. Open Power Control Box Cover (Open Power Control Box Cover task in this WP).
3. Tag the following electrical wires:
   a. At relay (Figure 7, Item 1):
      (1) White wire (Figure 7, Item 2) to pump control toggle switch
      (2) Red wire (Figure 7, Item 3) to red/blue diode
   b. At pump control toggle switch:
      (1) White wire (Figure 7, Item 2) to pump control toggle switch
      (2) Brown wire (Figure 7, Item 8) to remote connector

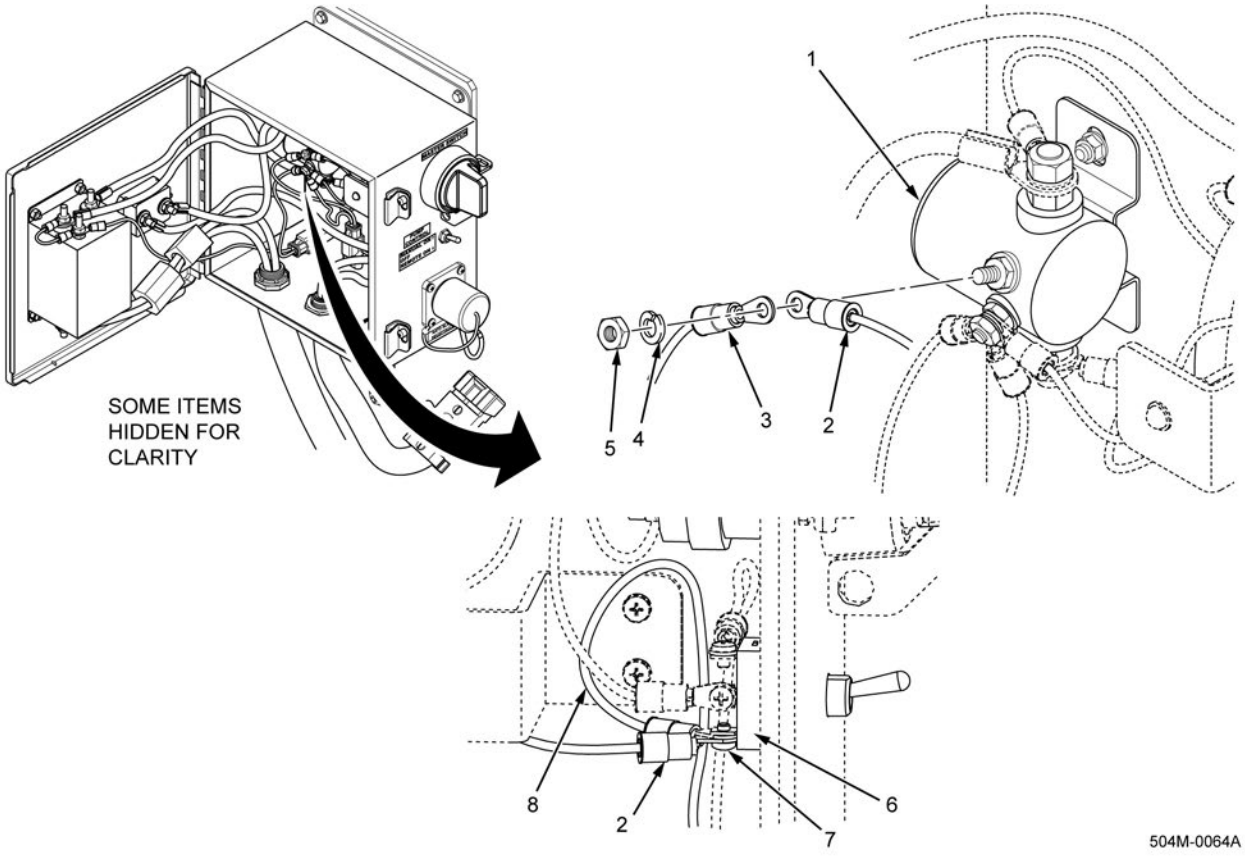


Figure 7. Removing Pump Control Toggle Switch to Relay (White) Wire.

4. Remove nut (Figure 7, Item 5) and lockwasher (Figure 7, Item 4), and disconnect red wire (Figure 7, Item 3) and pump control toggle switch to relay (white) wire (Figure 7, Item 2) from relay (Figure 7, Item 1).
5. Remove screw (Figure 7, Item 7) and disconnect brown wire (Figure 7, Item 8) and pump control toggle switch to white wire (Figure 7, Item 2) from pump control toggle switch (Figure 7, Item 6).

END OF TASK

PUMP CONTROL TOGGLE SWITCH TO RELAY (WHITE) WIRE INSTALLATION

1. Refer to tag and connect red wire (Figure 7, Item 3) and new pump control toggle switch to relay (white) wire (Figure 7, Item 2) to relay (Figure 7, Item 1) and secure with new lockwasher (Figure 7, Item 4) and nut (Figure 7, Item 5).
2. Refer to tags and connect brown wire (Figure 7, Item 8) and new pump control toggle switch to relay (white) wire (Figure 7, Item 2) to pump control toggle switch (Figure 7, Item 6) with screw (Figure 7, Item 7).
3. Remove and discard tags.
4. Close power control box cover (Close Power Control Box Cover task in this WP).

END OF TASK

RELAY GROUND (BLACK) WIRE REMOVAL

1. Ensure power is disconnected from MFS TRM (TM 10-4930-371-10).
2. Open Power Control Box Cover (Open Power Control Box Cover task in this WP).
3. Tag the following electrical wires:
    a. At relay (Figure 8, Item 11):
        (1) Blue wire to blue/black cable assembly (Figure 8, Item 7)
        (2) Blue wire to blue/red cable assembly (Figure 8, Item 10)
        (3) Ground (black) wire (Figure 8, Item 2)
    b. At ground lug (Figure 8, Item 5):
        (1) Ground (black) wire (Figure 8, Item 2)
        (2) Ground (black) wire (Figure 8, Item 4) to EMI channel filter input
        (3) Ground (black) wire (Figure 8, Item 6) to NATO slave receptacle
        (4) White wire (Figure 8, Item 3) to LED assembly

RELAY GROUND (BLACK) WIRE REMOVAL - Continued

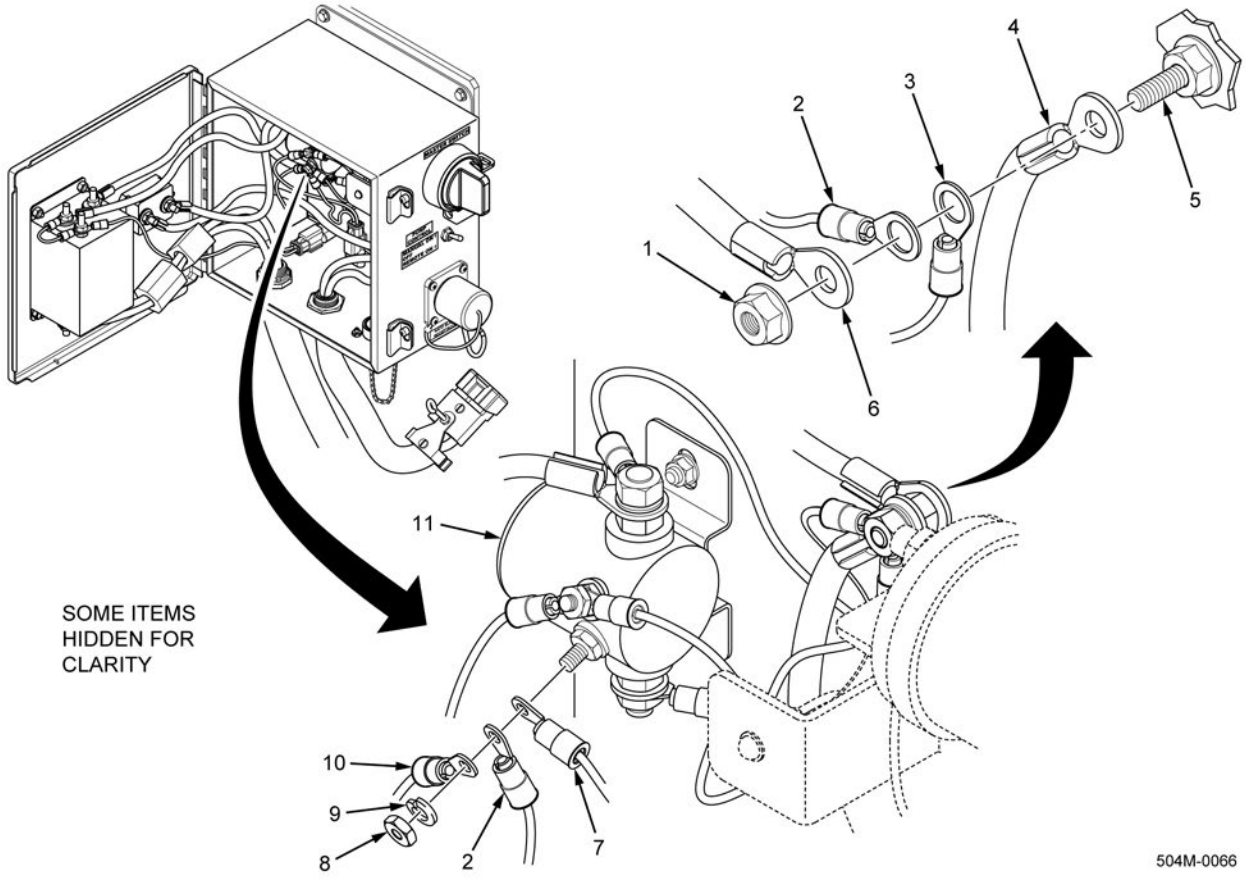


Figure 8. Ground (Black) Wire.

4. Remove nut (Figure 8, Item 8) and lockwasher (Figure 8, Item 9), and disconnect relay ground (black) wire (Figure 8, Item 2) and electrical wires (Figure 8, Items 7 and 10) from relay. Discard lockwasher.
5. Remove nut (Figure 8, Item 1) and disconnect electrical wires (Figure 8, Items 3 ,4 and 6) and relay ground (black) wire (Figure 8, Item 2) from ground lug (Figure 8, Item 5). Discard lockwasher.

END OF TASK

RELAY GROUND (BLACK) WIRE INSTALLATION

1. Attach new relay ground (black) wire (Figure 8, Item 2) and electrical wires (Figure 8, Items 3, 4 and 6) to ground lug (Figure 8, Item 5), and secure with nut (Figure 8, Item 1).
2. Attach electrical wires (Figure 8, Items 7 and 10) and new relay ground (black) wire (Figure 8, Item 2) to relay (Figure 8, Item 11), and secure with new lockwasher (Figure 8, Item 9) and nut (Figure 8, Item 8).
3. Remove and discard tags.
4. Close Power Control Box Cover (Close Power Control Box Cover task in this WP).

END OF TASK

EMI CHANNEL FILTER L1 INPUT POSITIVE (RED) WIRE REMOVAL

1. Ensure power is disconnected from MFS TRM (TM 10-4930-371-10).
2. Open Power Control Box Cover (Open Power Control Box Cover task in this WP).
3. Remove nut (Figure 9, Item 4) and lockwasher (Figure 9, Item 3), and disconnect EMI channel filter L1 INPUT positive (red) wire (Figure 9, Item 2) from relay (Figure 9, Item 1). Discard lockwasher.
4. Remove nut (Figure 9, Item 7) and washer (Figure 9 , Item 5), and disconnect EMI channel filter L1 INPUT positive (red) wire (Figure 9, Item 2) from EMI channel filter (Figure 9, Item 6).

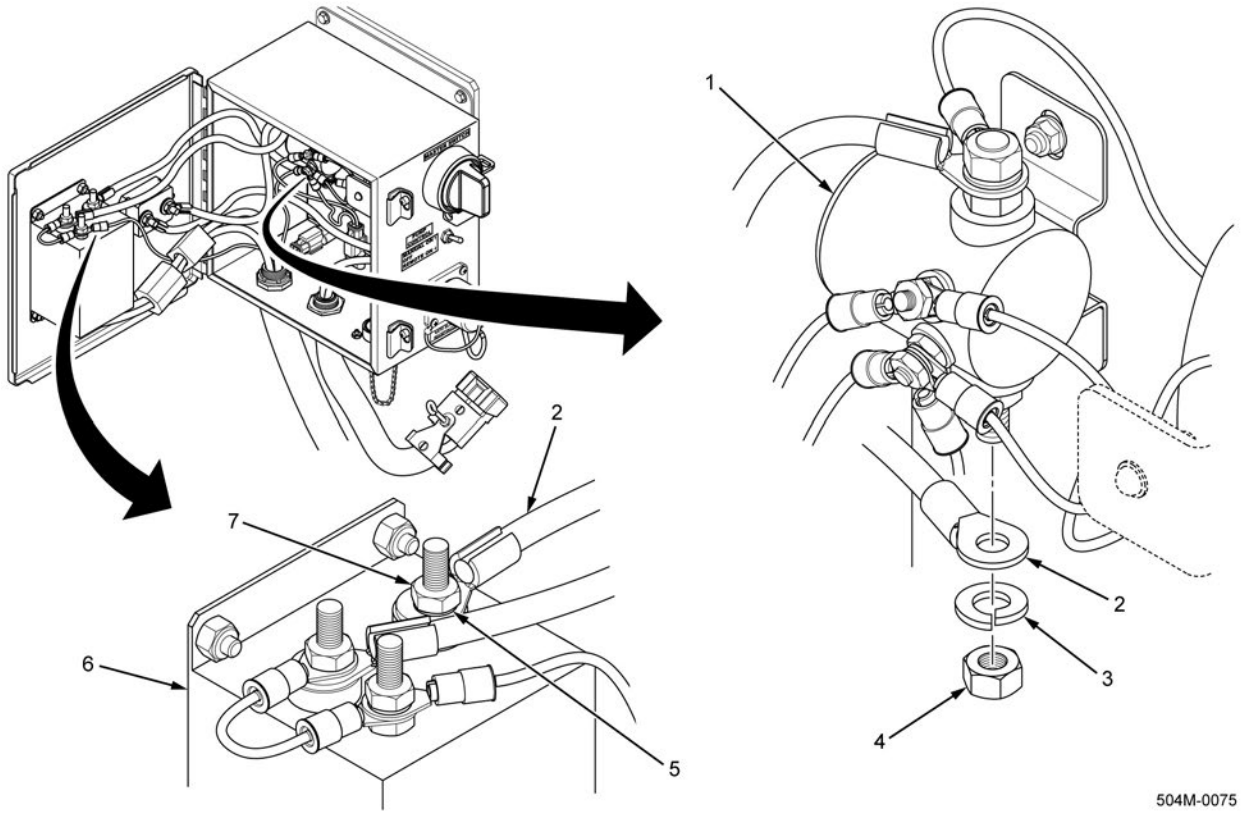


Figure 9. EMI Channel Filter L1 INPUT Positive (Red) Wire.

END OF TASK

EMI CHANNEL FILTER L1 INPUT POSITIVE (RED) WIRE INSTALLATION

1. Attach new EMI channel filter L1 INPUT positive (red) wire (Figure 9, Item 2) to EMI channel filter (Figure 9, Item 6), and secure with washer (Figure 9, Item 5) and nut (Figure 9, Item 7).
2. Attach new EMI channel filter L1 INPUT positive (red) wire (Figure 9, Item 2) to relay (Figure 9, Item 1), and secure with new lockwasher (Figure 9, Item 3) and nut (Figure 9, Item 4).
3. Close Power Control Box Cover (Close Power Control Box Cover task in this WP).

END OF TASK

EMI CHANNEL FILTER L2 INPUT GROUND (BLACK) WIRE REMOVAL

1. Ensure power is disconnected from MFS TRM (TM 10-4930-371-10).
2. Open Power Control Box Cover (Open Power Control Box Cover task in this WP).
3. Tag the following electrical wires attached to EMI channel filter and electrical wires (Figure 10, Items 1, 2, 3, and 4) attached to ground lug to aid in installation.
    a. At grounding lug (Figure 10, Item 5):
        (1) Ground (black) wire (Figure 10, Item 2) to relay
        (2) Ground (black) wire (Figure 10, Item 1) to EMI channel filter L2 input
        (3) Ground (black) wire (Figure 10, Item 4) to NATO slave receptacle
        (4) White wire (Figure 10, Item 3) to LED assembly
    b. At EMI channel filter (Figure 10, Item 8) L2 input:
        (1) EMI channel filter jumper (Figure 10, Item 9)
        (2) Ground (black) wire (Figure 10, Item 1) to grounding lug

EMI CHANNEL FILTER L2 INPUT GROUND (BLACK) WIRE REMOVAL - Continued

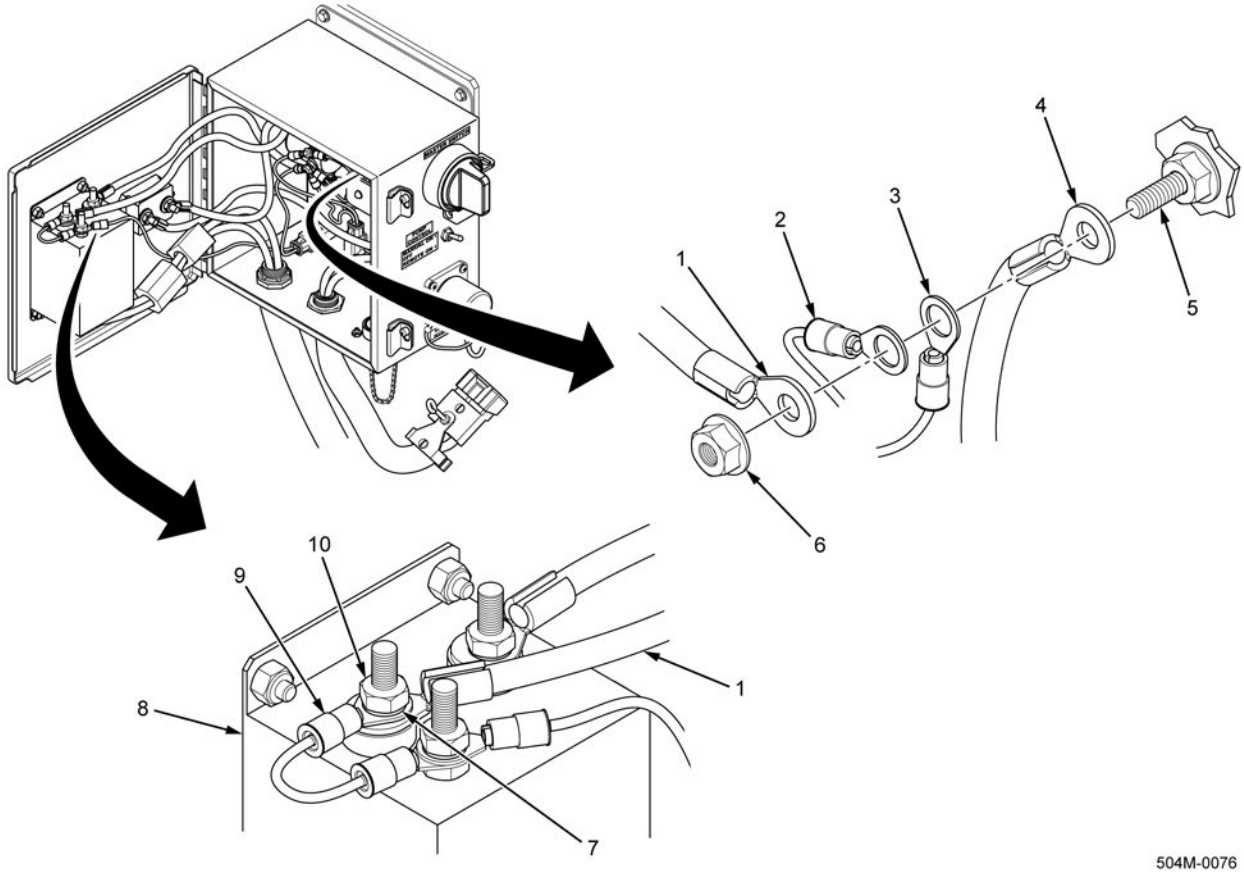


Figure 10. EMI Channel Filter L2 INPUT Ground (Black) Wire.

4. Remove nut (Figure 10, Item 6) and disconnect electrical wires (Figure 10, Items 2, 3, and 4) and EMI channel filter L2 INPUT ground (black) wire (Figure 10, Item 2) from ground lug (Figure 10, Item 5).
5. Remove nut (Figure 10, Item 10) and washer (Figure 10, Item 7), and disconnect electrical wire (Figure 10, Item 9) and EMI channel filter L2 INPUT ground (black) wire (Figure 10, Item 1) from EMI channel filter (Figure 10, Item 8).

END OF TASK

EMI CHANNEL FILTER L2 INPUT GROUND (BLACK) WIRE INSTALLATION

1. Refer to tags and attach electrical wire (Figure 10, Item 9) and new EMI channel filter L2 INPUT ground (black) wire (Figure 10, Item 1) to EMI channel filter (Figure 10, Item 8), and secure with washer (Figure 10, Item 7) and nut (Figure 10, Item 10).
2. Refer to tags and attach electrical wires (Figure 10, Items 2, 3, and 4) and new EMI channel filter L2 INPUT ground (black) wire (Figure 10, Item 1) to ground lug (Figure 10, Item 5), and secure with nut (Figure 10, Item 6).
3. Remove and discard tags.

EMI CHANNEL FILTER L2 INPUT GROUND (BLACK) WIRE INSTALLATION - Continued

4. Close Power Control Box Cover (Close Power Control Box Cover task in this WP).

END OF TASK

EMI CHANNEL FILTER PE TO L2 INPUT JUMPER (BLACK) WIRE REMOVAL

1. Ensure power is disconnected from MFS TRM (TM 10-4930-371-10).
2. Open Power Control Box Cover (Open Power Control Box Cover task in this WP).
3. Tag the following electrical wires attached to EMI channel filter (Figure 11, Item 6):
   a. Jumper (black) wire (Figure 11, Item 7)
   b. Ground (black) wire (Figure 11, Item 3) to blue/black diode
   c. Ground (black) wire (Figure 11, Item 2) to ground lug

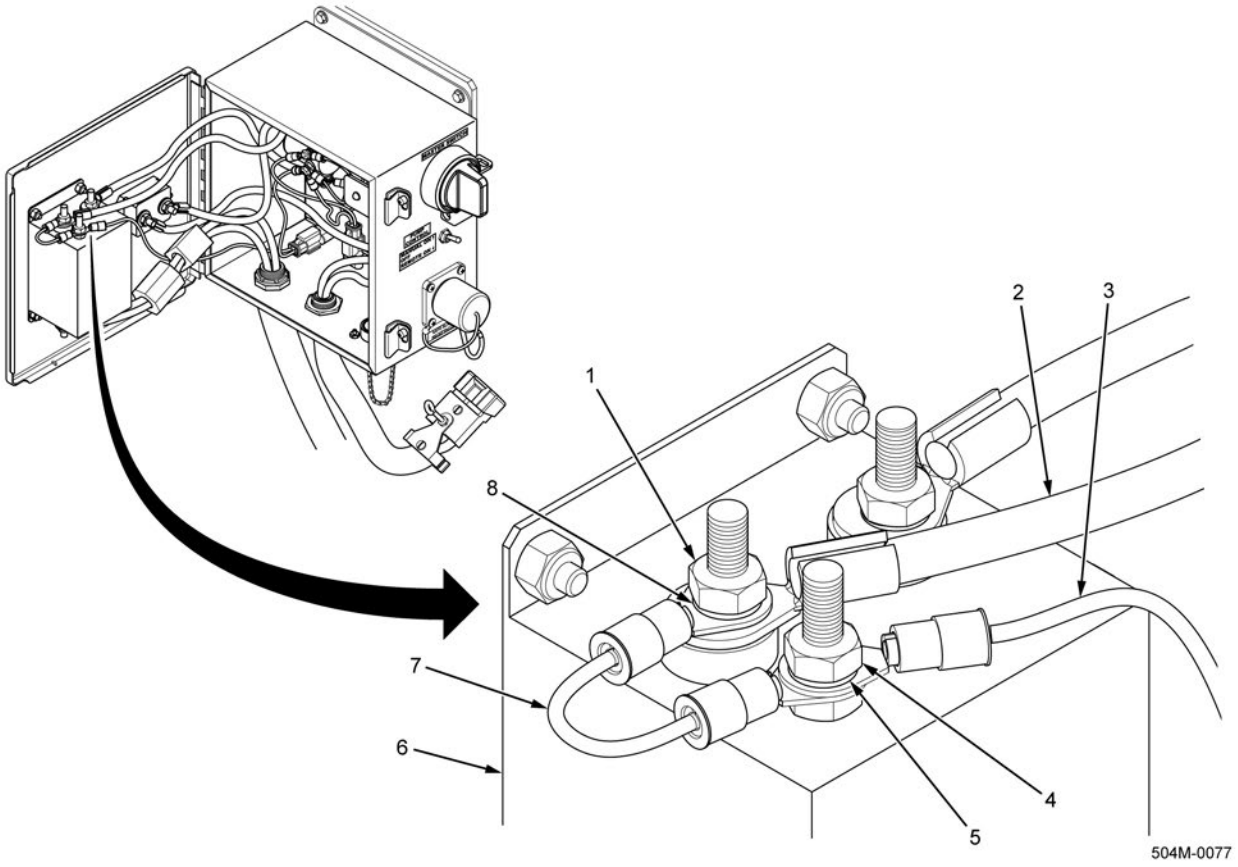


Figure 11. EMI Channel Filter PE to L2 INPUT Jumper (Black) Wire.

4. Remove nut (Figure 11, Item 4) and washer (Figure 11, Item 5), and disconnect electrical wire (Figure 11, Item 3) and EMI channel filter PE to L2 INPUT jumper (black) wire (Figure 11, Item 7) from EMI channel filter (Figure 11, Item 6) L2 lug.

EMI CHANNEL FILTER PE TO L2 INPUT JUMPER (BLACK) WIRE REMOVAL - Continued

5. Remove nut (Figure 11, Item 1) and washer (Figure 11, Item 8), and disconnect electrical wire (Figure 11, Item 2) and EMI channel filter PE to L2 INPUT jumper (black) wire (Figure 11, Item 7) from EMI channel filter (Figure 11, Item 6) PE lug.

END OF TASK

EMI CHANNEL FILTER PE TO L2 INPUT JUMPER (BLACK) WIRE INSTALLATION

1. Refer to tags and attach electrical wire (Figure 11, Item 3) and new EMI channel filter PE to L2 INPUT jumper (black) wire (Figure 11, Item 7) to EMI channel filter (Figure 11, Item 6) PE lug, and secure with washer (Figure 11, Item 5) and nut (Figure 11, Item 4).
2. Refer to tags and attach electrical wire (Figure 11, Item 2) and new EMI channel filter PE to L2 INPUT jumper (black) wire (Figure 11, Item 7) to EMI channel filter (Figure 11, Item 6) L2 lug, and secure with washer (Figure 11, Item 8) and nut (Figure 11, Item 1).
3. Remove and discard tags.
4. Close Power Control Box Cover (Close Power Control Box Cover task in this WP).

END OF TASK

ELECTRIC MOTOR POWER CABLE REMOVAL

1. Ensure power is disconnected from MFS TRM (TM 10-4930-371-10).
2. Open Power Control Box Cover (Open Power Control Box Cover task in this WP).

NOTE

Note orientation and routing of wires, conduit and cable ties to aid in installation.

3. Remove ferrite cores (Figure 12, Item 6) from EMI channel filter wires (Figure 12, Item 2 and 3).
4. Remove two nuts (Figure 12, Item 4), four flat washers (Figure 12, Item 5) and cables (Figure 12, Items 2 and 3) from EMI channel filter (Figure 12, Item 1),

ELECTRIC MOTOR POWER CABLE REMOVAL - Continued

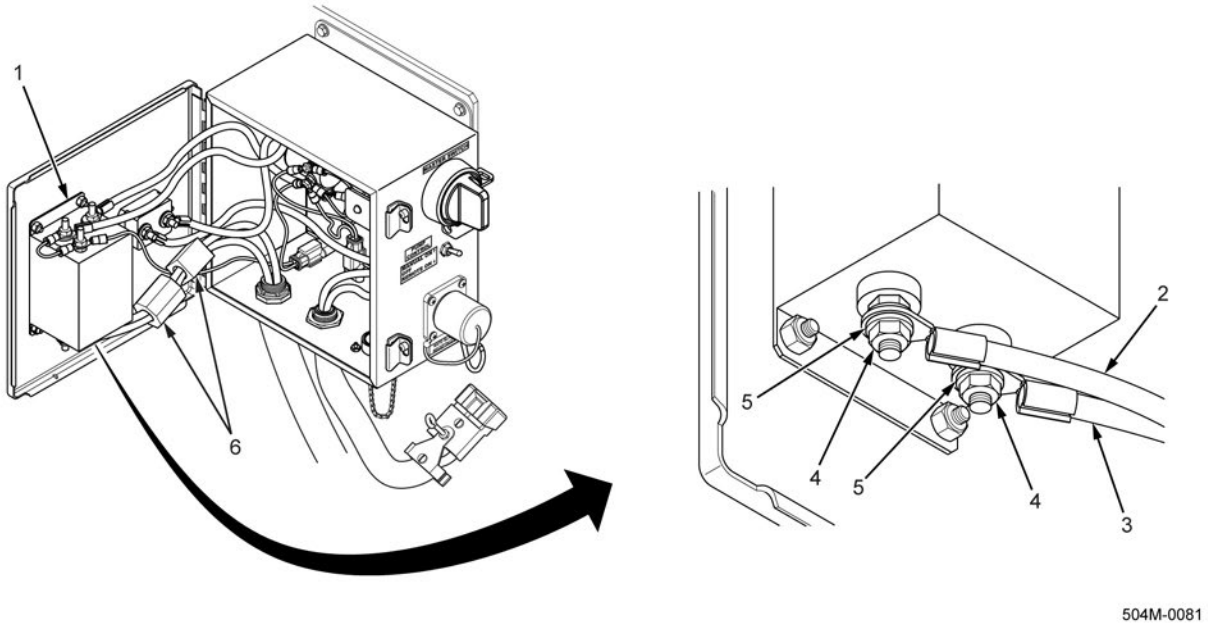


Figure 12. Electric Motor Power Cable from EMI Channel Filter.

5. Remove conduit nut (Figure 13, Item 3), and remove conduit (Figure 13, Item 4) with wires (Figure 13, Items 1 and 2) from Power Control Box (Figure 13, Item 5).

ELECTRIC MOTOR POWER CABLE REMOVAL - Continued

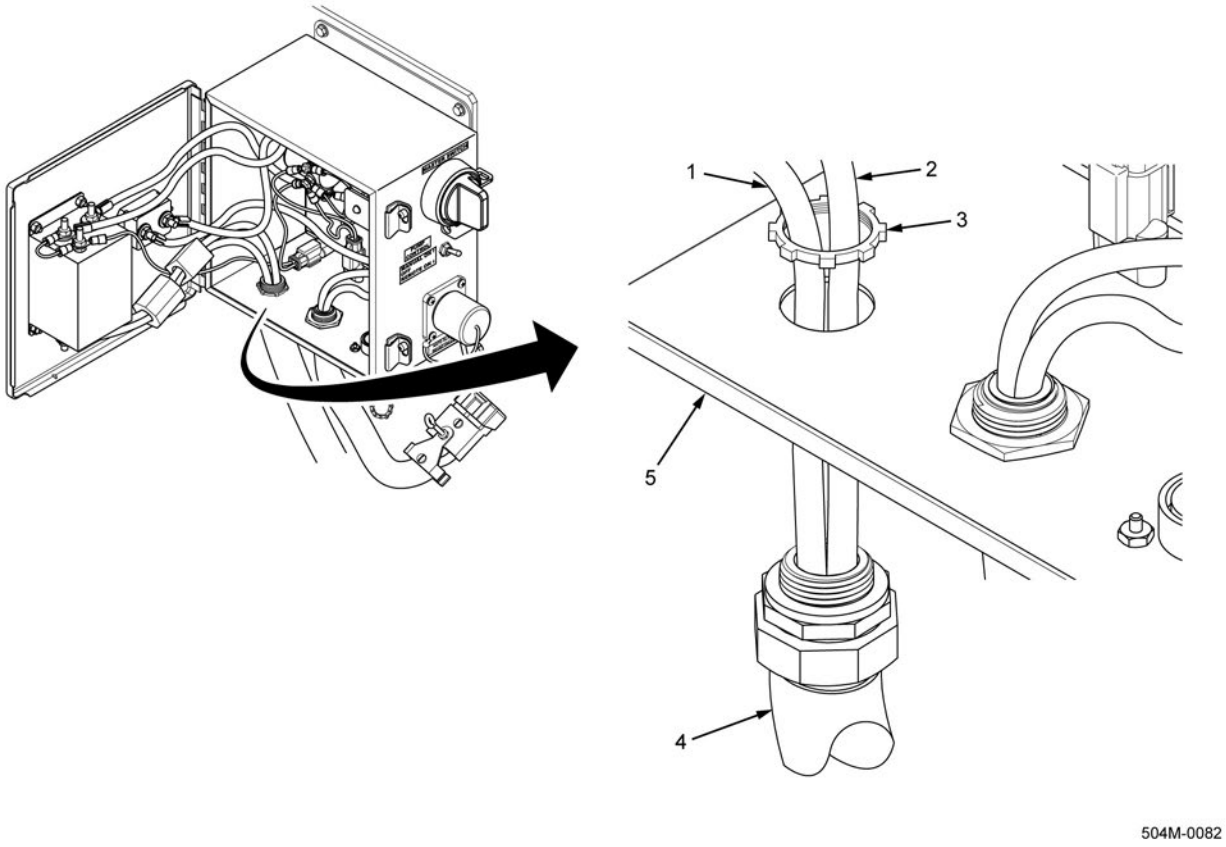


Figure 13. Removing Electric Motor Power Cable from Power Control Box.

ELECTRIC MOTOR POWER CABLE REMOVAL - Continued

6. Remove two screws (Figure 14, Item 1) and remove conduit box cover (Figure 14, Item 2) from conduit box (Figure 14, Item 3).

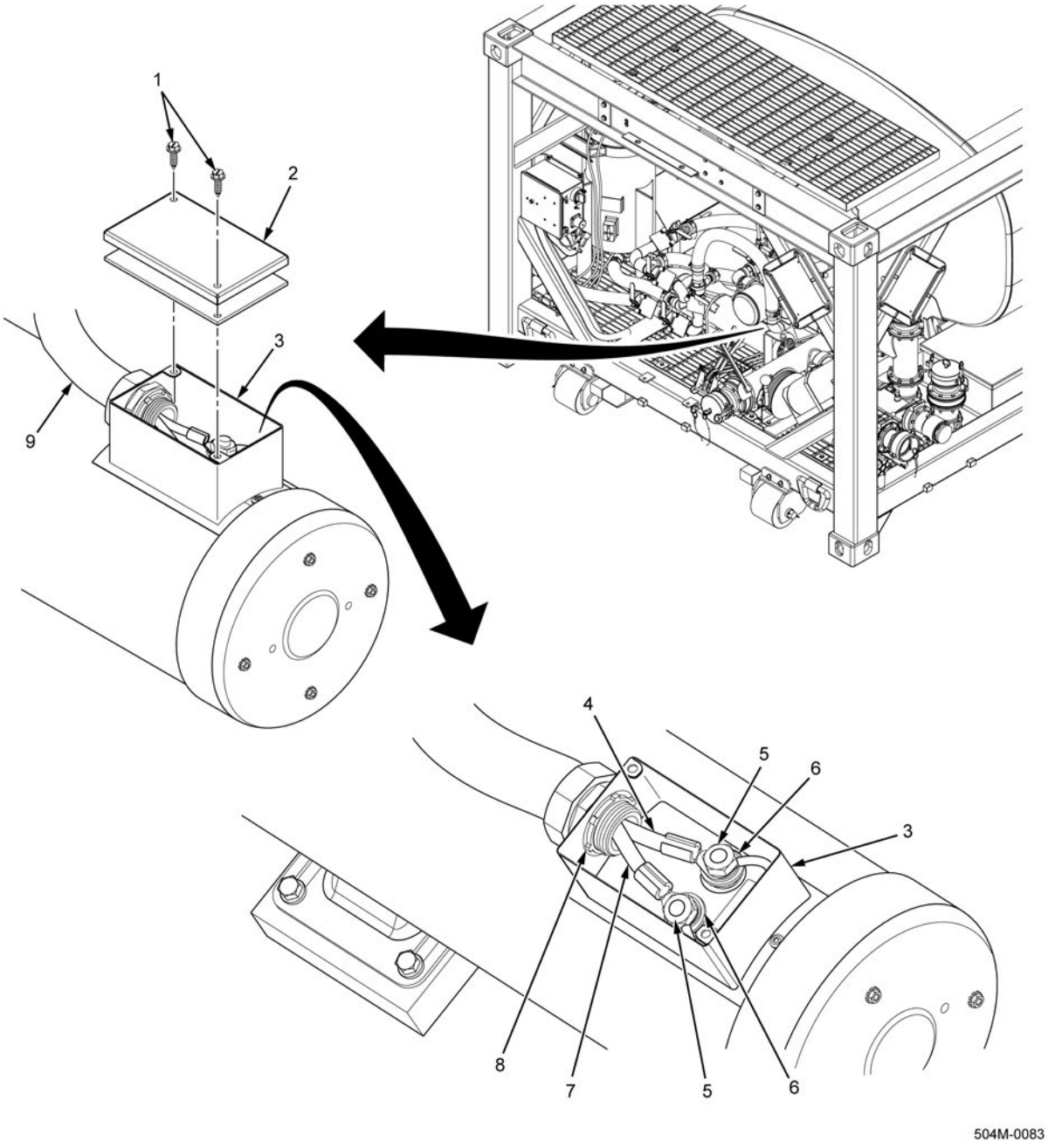


Figure 14. Disconnecting and Removing Electric Motor Power Cable from Electric Motor.

7. Remove two nuts (Figure 14, Item 5) and two flat washers (Figure 14, Item 6), and disconnect red wire (Figure 14, Item 4) and ground (black) wire (Figure 14, Item 7) from electric motor.

ELECTRIC MOTOR POWER CABLE REMOVAL - Continued

8. Remove conduit nut (Figure 14, Item 8) and remove electric motor power conduit (Figure 14, Item 9) and wires (Figure 14, Items 4 and 7) from conduit box (Figure 14, Item 3).
9. Cut three cable ties (Figure 15, Item 1).

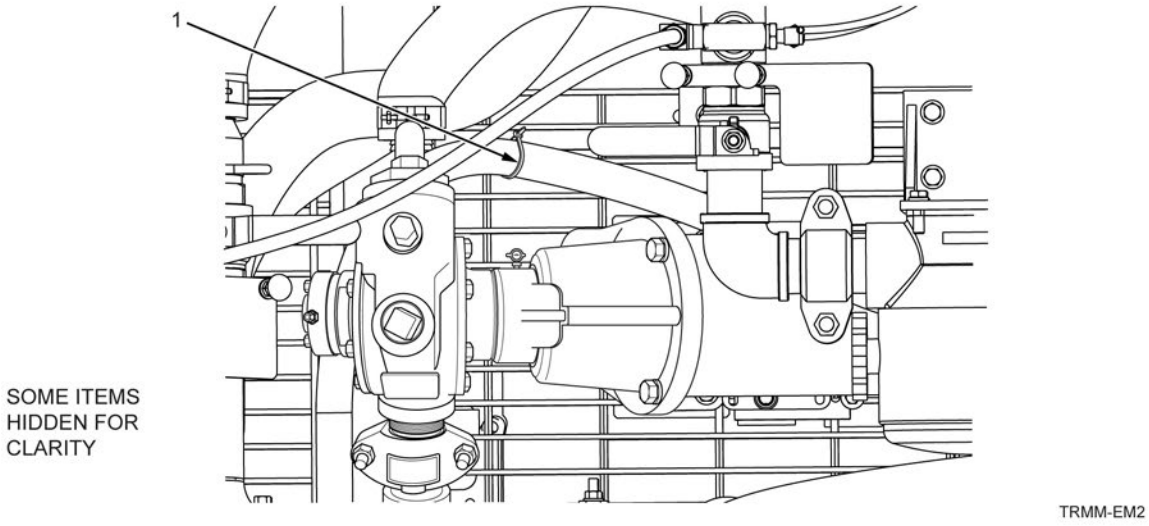


Figure 15. Cable Ties.

END OF TASK

ELECTRIC MOTOR POWER CABLE INSTALLATION

NOTE

Ensure plastic washer on cable assembly remains on cable during installation.

1. Install new cable assembly (Figure 16, Item 9) through hole in conduit box (Figure 16, Item 3).
2. Loosely install conduit nut (Figure 16, Item 8) on cable assembly (Figure 16, Item 9).
3. Install electrical wires (Figure 16, Items 4 and 7) with two flat washers (Figure 16, Item 6) and nuts (Figure 16, Item 5) in the orientation noted during removal.
4. Tighten conduit nut (Figure 16, Item 8).
5. Install conduit box cover (Figure 16, Item 2) on box (Figure 16, Item 3) with two screws (Figure 16, Item 1).

ELECTRIC MOTOR POWER CABLE INSTALLATION - Continued

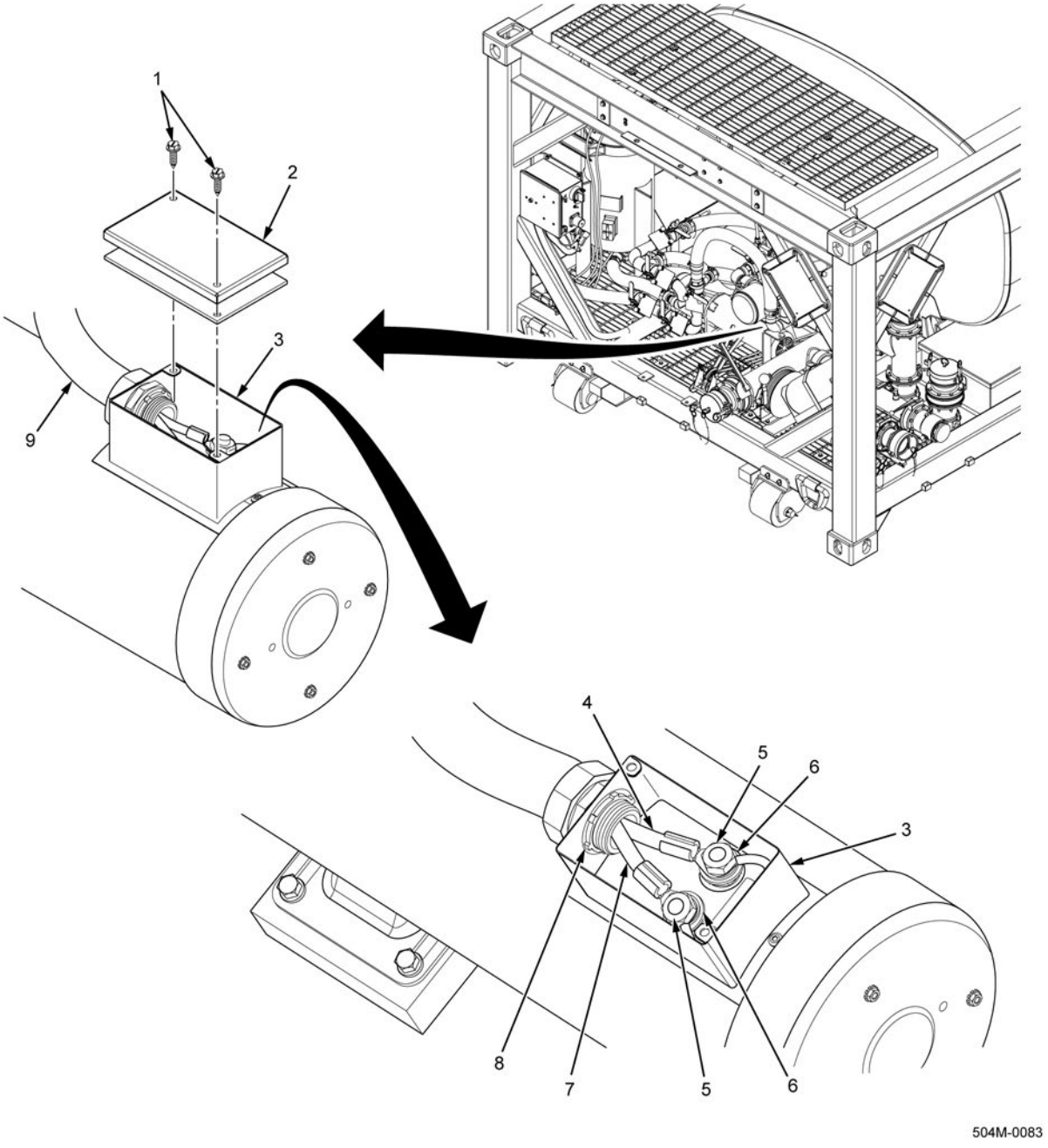


Figure 16. Connecting and Installing Electric Motor Power Cable to Electric Motor.

NOTE

Ensure plastic washer is between conduit fitting and power control box.

6. Install wires (Figure 17, Items 1 and 2) and cable assembly (Figure 17, Item 4) into power control box (Figure 17, Item 7).

ELECTRIC MOTOR POWER CABLE INSTALLATION - Continued

7. Install conduit nut (Figure 17, Item 3) on conduit fitting (Figure 17, Item 5).

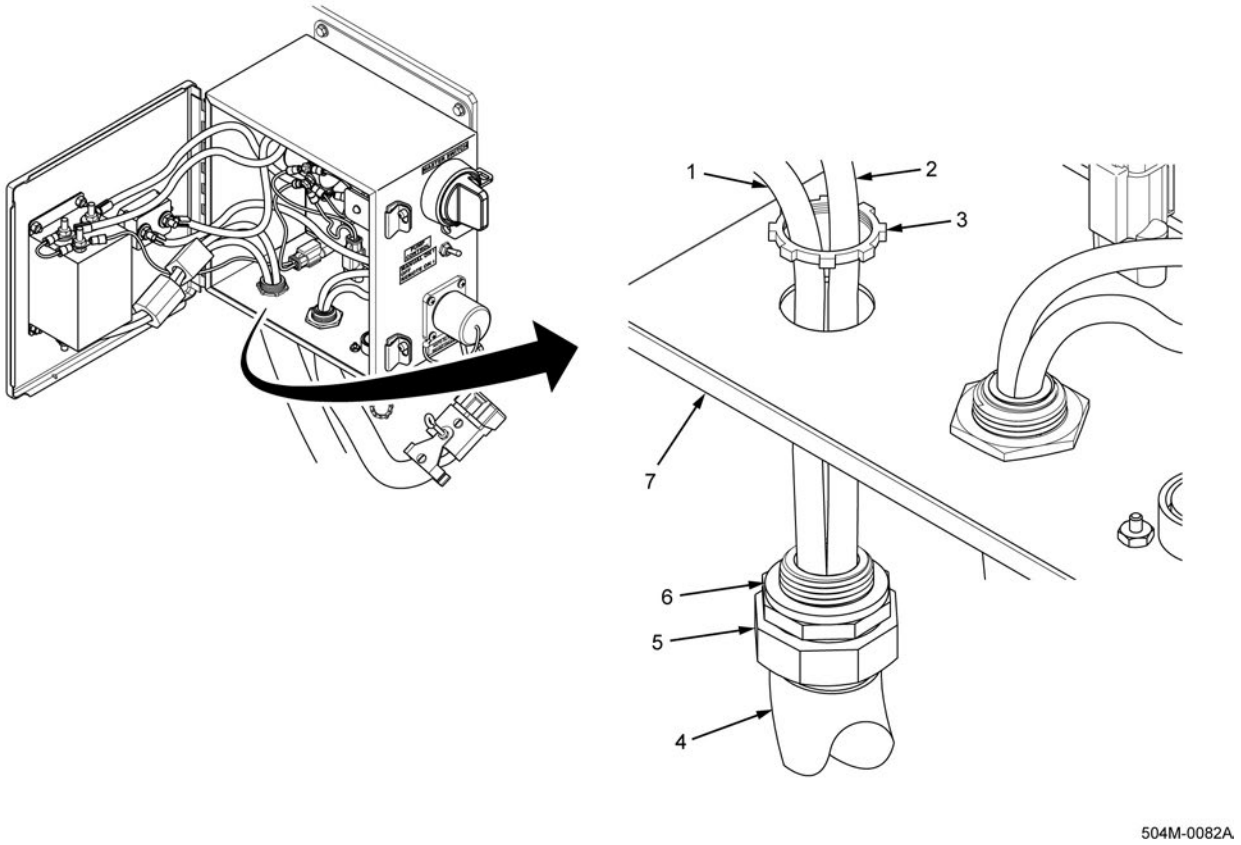


Figure 17. Installing Electric Motor Power Cable on Power Control Box.

8. Install positive (red) wire (Figure 18, Item 3) onto L1 lug of EMI channel filter (Figure 18, Item 1) with two flat washers (Figure 18, Item 5) and nut (Figure 18, Item 4).
9. Install ground (black) wire (Figure 18, Item 2) onto L2 lug of EMI channel filter (Figure 18, Item 1) with two flat washers (Figure 18, Item 5) and nut (Figure 18, Item 4).

ELECTRIC MOTOR POWER CABLE INSTALLATION - Continued

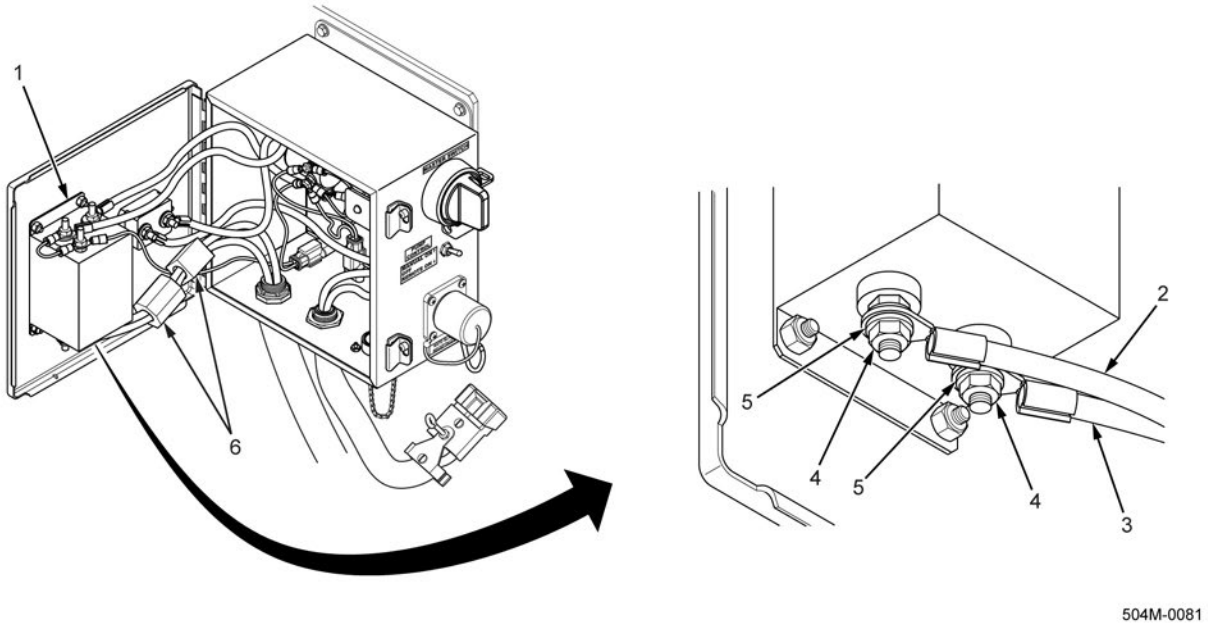


Figure 18. Connecting Electric Motor Power Cable to EMI Channel Filter.

10. Install ferrite cores (Figure 18, Item 6) on wires (Figure 18, Items 2 and 3).
11. Install three new cable ties (Figure 19, Item 1).

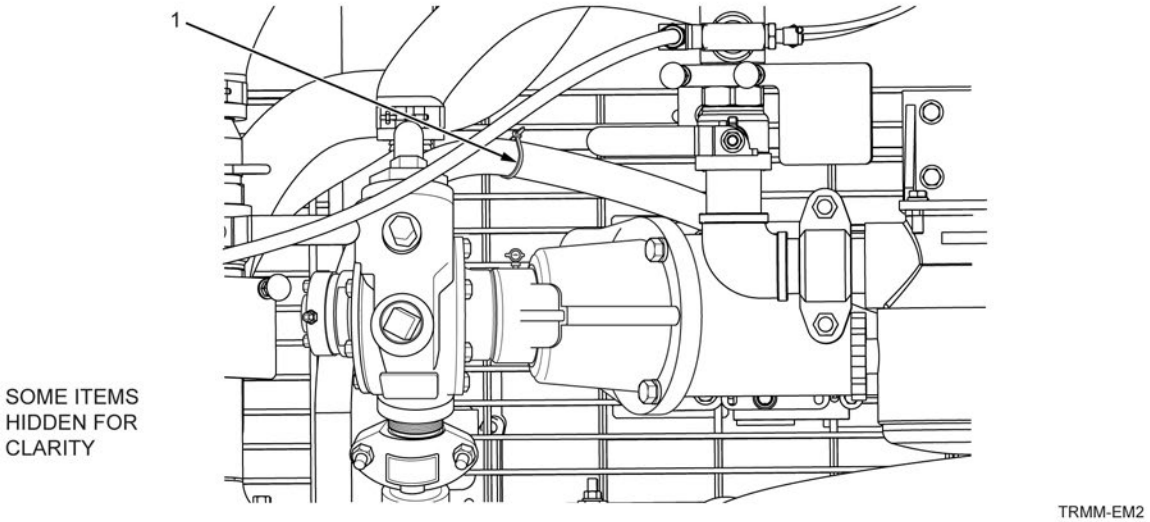


Figure 19. Cable Tie.

12. Remove and discard tags.

ELECTRIC MOTOR POWER CABLE INSTALLATION - Continued

13. Close Power Control Box Cover (Close Power Control Box Cover task in this WP).

END OF TASK

NATO POWER CONNECTOR PIGTAIL REMOVAL

1. Ensure power is disconnected from MFS TRM (TM 10-4930-371-10).
2. Open Power Control Box Cover (Open Power Control Box Cover task in this WP).
3. Tag electrical wires (Figure 20, Items 1, 2, 5, 7, and 10) attached to NATO slave receptacle (Figure 20, Item 6) to aid in installation.

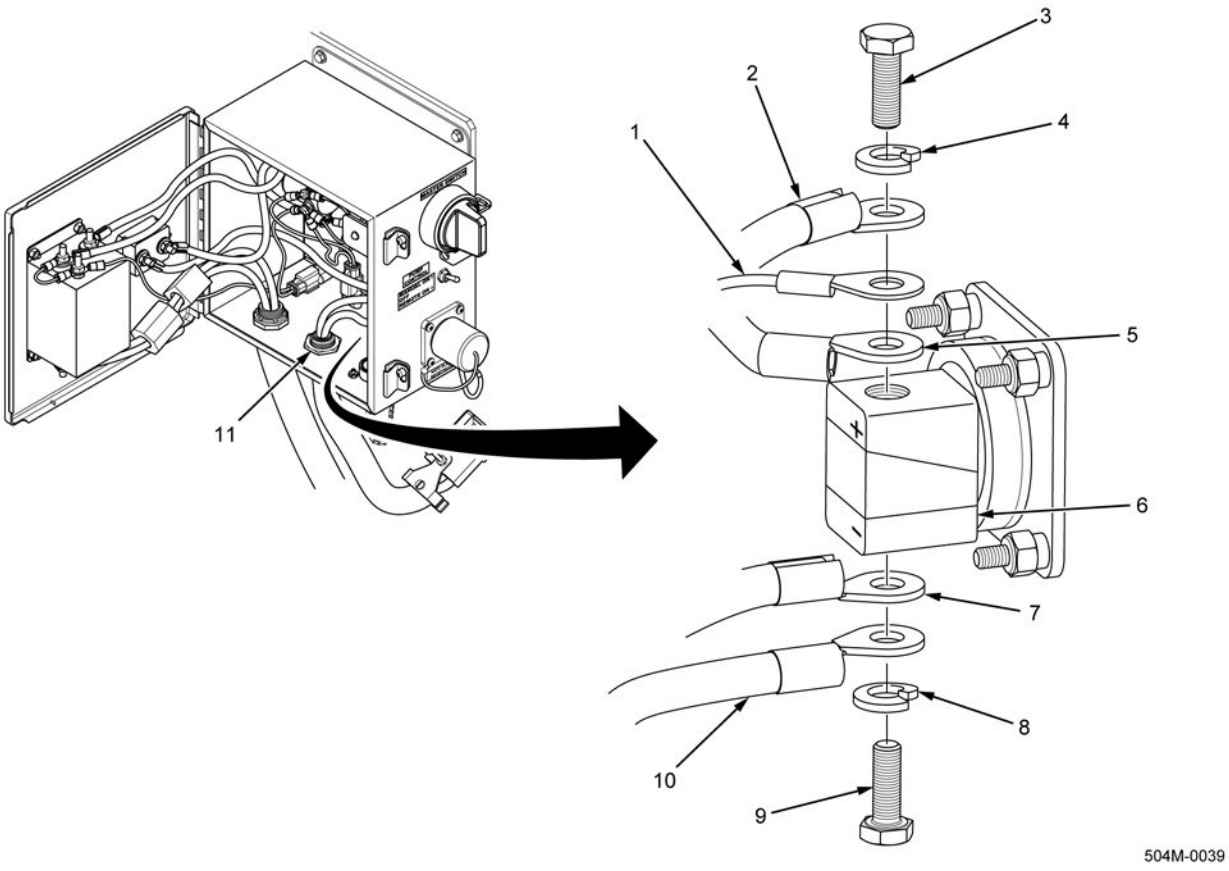


Figure 20. Disconnecting NATO Power Connector Pigtail.

4. Remove two bolts (Figure 20, Items 3 and 9) and two lockwashers (Figure 20, Items 4 and 8) and disconnect electrical wires (Figure 20, Items 1, 2, 5, 7, and 10) from NATO slave receptacle (Figure 20, Item 6). Discard lockwashers.
5. Remove conduit nut (Figure 20, Item 11).
6. Remove NATO power connector pigtail (Figure 21, Item 5) from outside power control box (Figure 21, Item 2).

NATO POWER CONNECTOR PIGTAIL REMOVAL - Continued

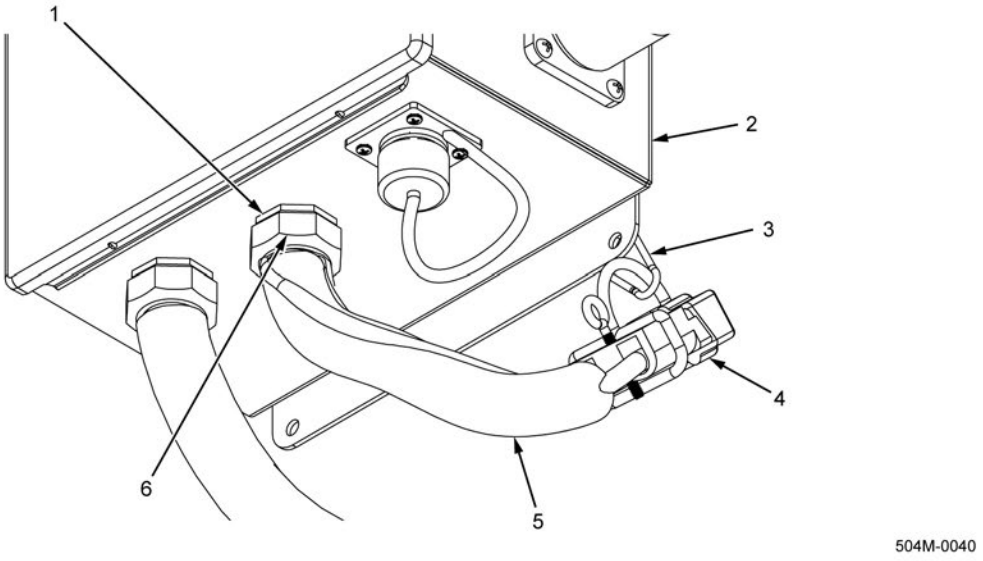


Figure 21. Removing NATO Power Connector Pigtail.

7. Disconnect block connector (Figure 21, Item 4) from carabiner (Figure 21, Item 3).

END OF TASK

NATO POWER CONNECTOR PIGTAIL INSTALLATION

1. Transfer tags from electrical wires on faulty NATO power connector pigtail to corresponding wires on new NATO power connector pigtail (Figure 21, Item 5).
2. Install pigtail conduit fitting (Figure 21, Item 6) into power control box (Figure 21, Item 2) making sure o-ring (Figure 21, Item 1) is between fitting (Figure 21, Item 6) and power control box (Figure 21, Item 2).
3. Install conduit nut (Figure 22, Item 11).
4. Install positive (red) wire (Figure 22, Item 2) and electrical wires (Figure 22, Items 1 and 5) on NATO slave receptacle (Figure 22, Item 6) and secure with new lockwasher (Figure 22, Item 4) and bolt (Figure 22, Item 3).
5. Install ground (black) wire (Figure 22, Item 7) electrical wire (Figure 22, Item 10) to NATO slave connector (Figure 22, Item 6) and secure with new lockwasher (Figure 22, Item 8) and bolt (Figure 22, Item 9).

NATO POWER CONNECTOR PIGTAIL INSTALLATION - Continued

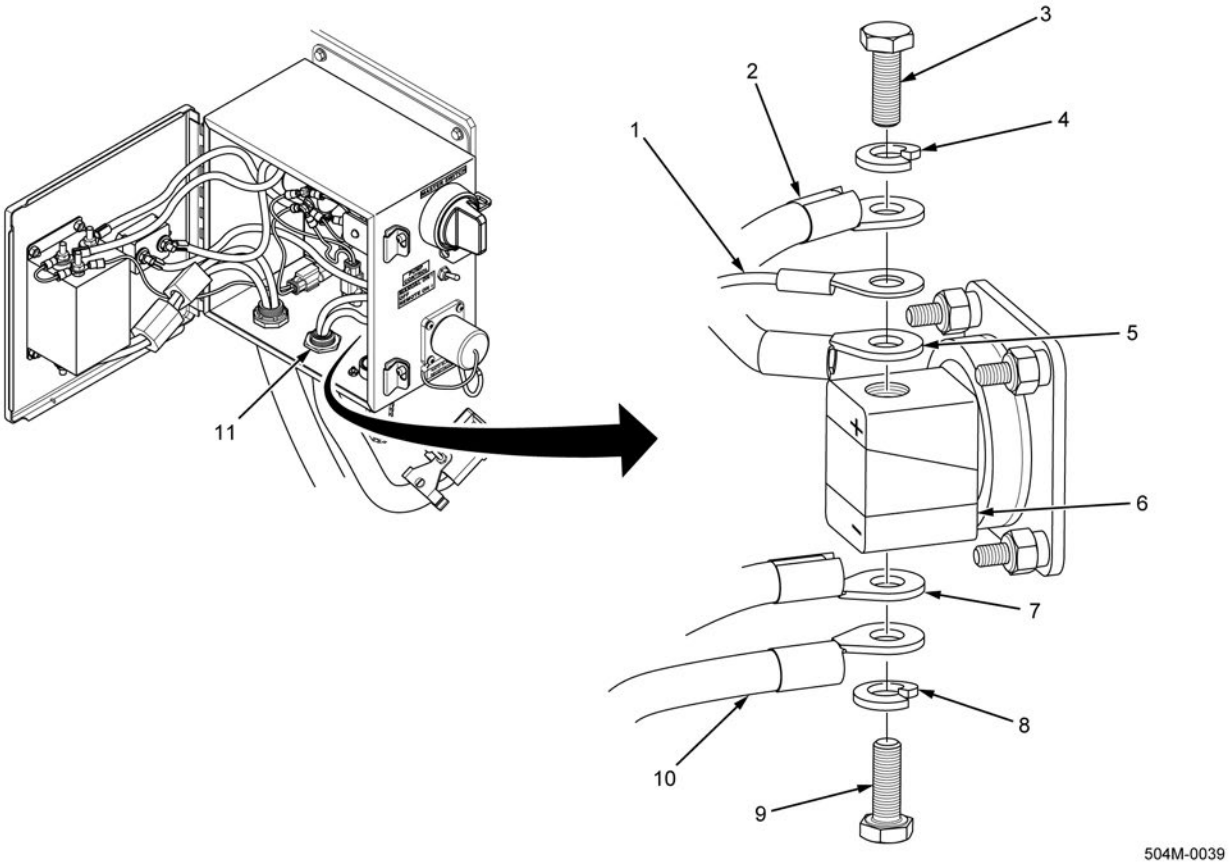


Figure 22. Connecting NATO Power Connector Pigtail.

6. Remove and discard tags.
7. Close Power Control Box Cover (Close Power Control Box Cover task in this WP).

END OF TASK

FOLLOW-ON MAINTENANCE

Apply power to MFS TRM to verify proper operation (TM 10-4930-371-10).

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
BII/COEI CABINET ASSEMBLY REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool kit, general mechanic's (WP 0217, Table 1, Item 13)

Materials/Parts
Sealant, Silicone, RTV (WP 0216, Table 1, Item 12)
Nut, self-locking, hexagon (LOCKNUTS) Qty: 6 (WP 0195, Figure 49, Item 11)
BII/COEI Cabinet Assembly Qty: 8 (WP 0195, Figure 49, Item 17)

Personnel Required
91J Quartermaster and Chemical Equipment Repairer (2)

Equipment Condition
MFS TRM grounded (TM 10-4930-371-10)

Time to Complete
1.5 Hour(s)

REMOVAL

1. Remove cotter pins (Figure 1, Item 2), release two latches (Figure 1, Item 1) and open BII/COEI lid assembly (Figure 1, Item 3).
2. Remove all items from BII/COEI cabinet (Figure 1, Item 4).
3. Remove six bolts (Figure 1, Item 5), flat washers (Figure 1, Item 6), flat washers (Figure 1, Item 7) and locknuts (Figure 1, Item 8). Discard locknuts.
4. Close BII/COEI lid assembly (Figure 1, Item 3) and remove stowable ladder.
5. Lift BII/COEI cabinet assembly (Figure 1, Item 4) out of MFS TRM.

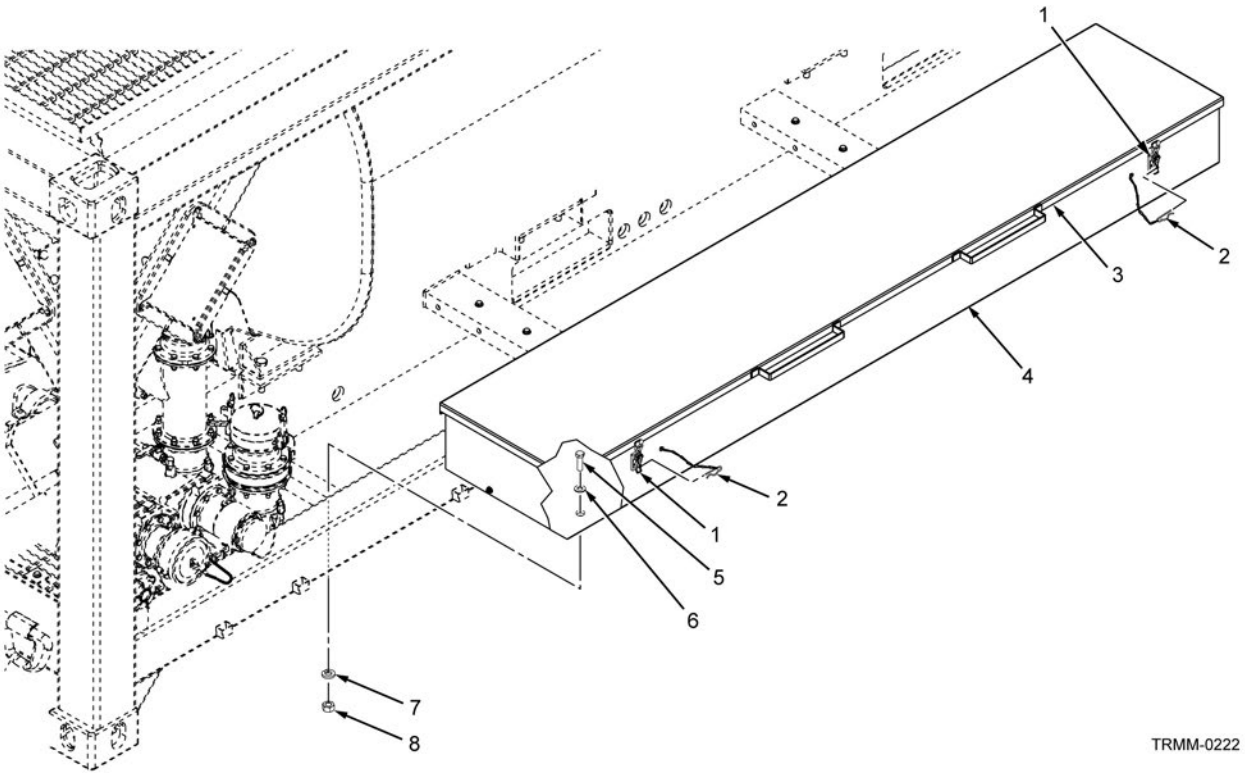


Figure 1. Removing BII/COEI Cabinet.

END OF TASK

INSTALLATION

WARNING

RTV sealant may cause irritation or discomfort to the eyes, skin, nose and throat and should not be ingested. Safety glasses, goggles, rubber gloves and aprons should be worn when handling. Clean-up materials and applicators should be recycled or disposed of IAW local protocol. Failure to comply may cause injury to personnel and damage to the environment.

1. Apply thin bead of RTV sealant around perimeter of six flat washers (Figure 1, Item 6).
2. Install BII/COEI cabinet assembly (Figure 1, Item 3) and secure with six bolts (Figure 1, Item 5), flat washers (Figure 1, Item 6), flat washers (Figure 1, Item 7) and new locknuts (Figure 1, Item 8).
3. Stow all previously removed items in BII/COEI cabinet (Figure 1, Item 4).
4. Close BII/COEI cabinet lid assembly (Figure 1, Item 3) and secure with two latches (Figure 1, Item 1) and pin (Figure 1, Item 2).
5. Reinstall stowable ladder.

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
BII/COEI CABINET ASSEMBLY REPAIR

INITIAL SETUP:

Tools and Special Tools
Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
Gloves, disposable nitrile (WP 0216, Table 1, Item 5)
Respirator (WP 0216, Table 1, Item 11)

Materials/Parts
Adhesive, multi-purpose (WP 0216, Table 1, Item 2)

Personnel Required
91J Quartermaster and Chemical Equipment Repairer (2)

References
WP 0120

Equipment Condition
MFS TRM grounded (TM 10-4930-371-10)
MFS TRM on ground (TM 10-4930-371-10)

Time to Complete
1.5 Hour(s)

BII/COEI CABINET LATCHES DISASSEMBLY

1. Open BII/COEI cabinet assembly (Figure 1, Item 1).
2. Remove bolt (Figure 1, Item 8) and locknut (Figure 1, Item 6). Discard locknut.
3. Remove sash chain (Figure 1, Item 7) and hitch pin (Figure 1, Item 9).
4. Remove hitch pin (Figure 1, Item 9) from sash chain (Figure 1, Item 7).
5. Remove four acorn nuts (Figure 1, Item 2), screws (Figure 1, Item 4), and draw latch keeper (Figure 1, Item 3).
6. Remove three screws (Figure 1, Item 12), locknuts (Figure 1, Item 5), latch spacer (Figure 1, Item 10), and draw latch (Figure 1, Item 11).

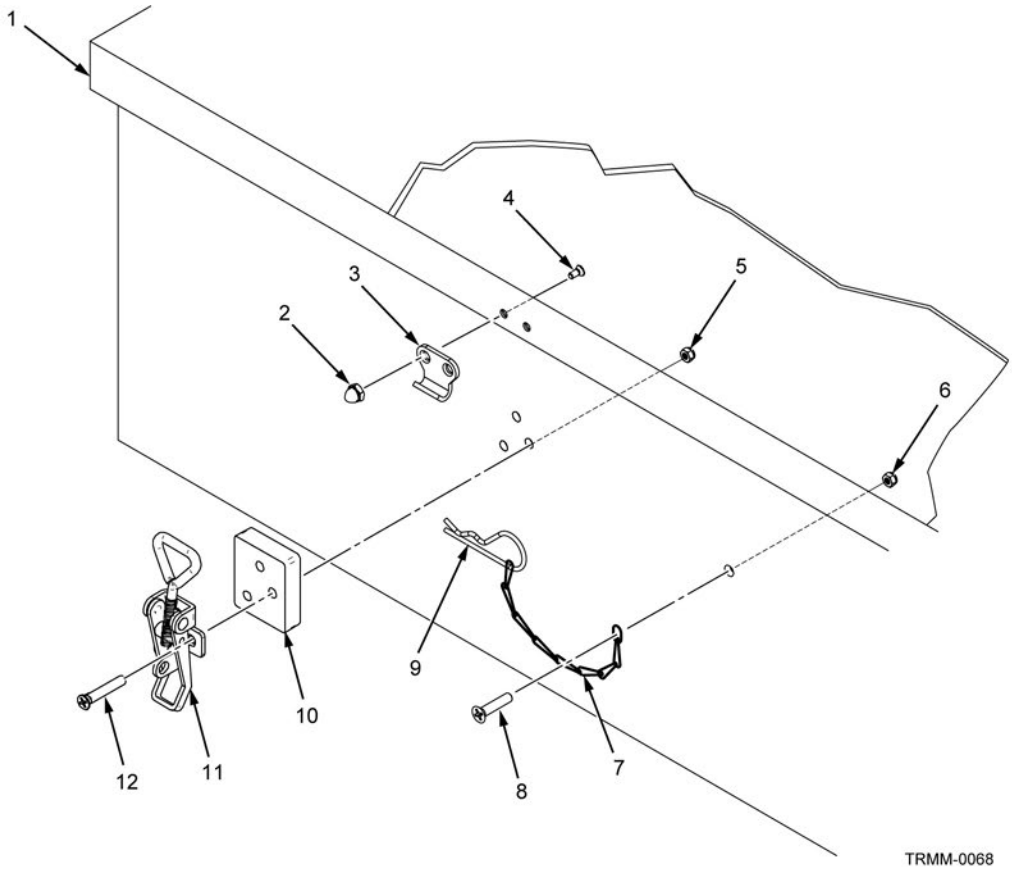


Figure 1. BII/COEI Cabinet Assembly Latches.

END OF TASK

BII/COEI CABINET LATCHES ASSEMBLY

1. Install hitch pin (Figure 1, Item 9) on sash chain (Figure 1, Item 7).
2. Install sash chain (Figure 1, Item 7) and hitch pin (Figure 1, Item 9) using two bolts (Figure 1, Item 8) and new locknuts (Figure 1, Item 6).
3. Install draw latches (Figure 1, Item 11) with six screws (Figure 1, Item 12), two latch spacers (Figure 1, Item 10), six new locknuts (Figure 1, Item 5).
4. Install two draw latch keepers (Figure 1, Item 3) with four screws (Figure 1, Item 4) and acorn nuts (Figure 1, Item 2).
5. Close BII/COEI cabinet assembly.

END OF TASK

BII/COEI CABINET ASSEMBLY GAS SPRING DISASSEMBLY

NOTE

Note orientation of hardware and components to aid in installation.

1. Open BII/COEI cabinet assembly (Figure 2, Item 3).
2. Pull locking clip (Figure 2, Item 5) from each gas spring end socket (Figure 2, Item 2) to release gas spring (Figure 2, Item 4) end from both mounting studs (Figure 2, Item 1).
3. Carefully pry both ends of gas spring (Figure 2, Item 4) from mounting studs (Figure 2, Item 1).

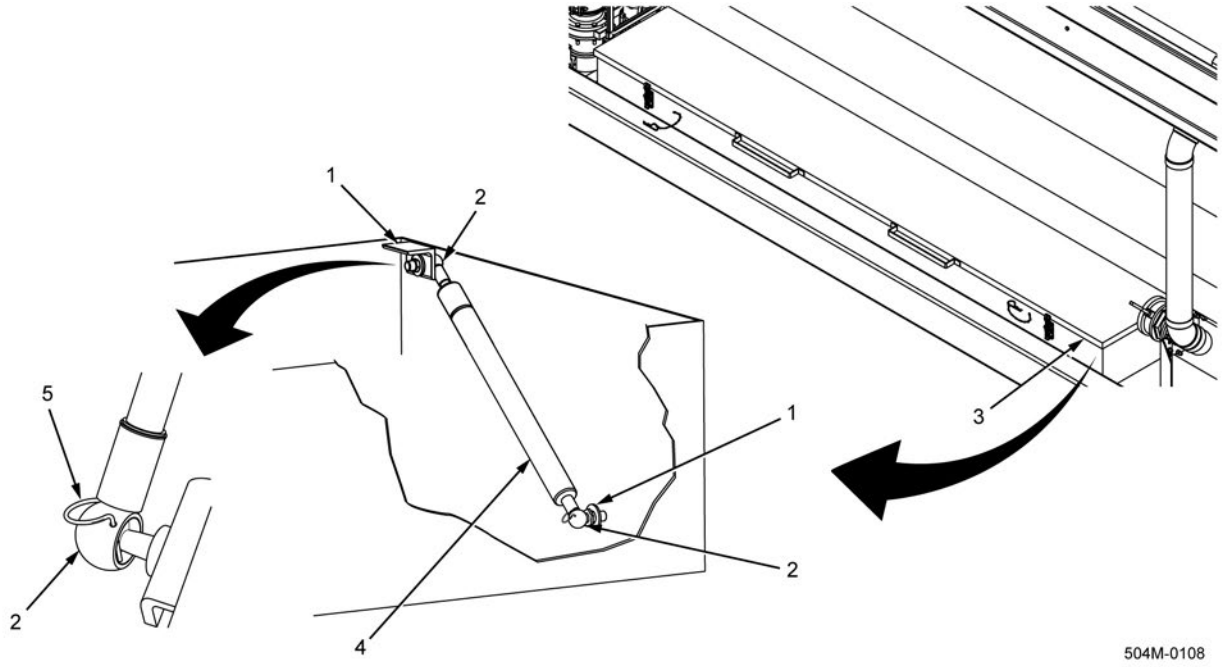


Figure 2. BII/COEI Cabinet Assembly Latches.

END OF TASK

BII/COEI CABINET LATCHES GAS SPRING ASSEMBLY

1. Install ends of gas spring (Figure 2, Item 4) on mounting studs (Figure 2, Item 1).
2. Insert locking clip (Figure 2, Item 5) on each to lock into place.
3. Close BII/COEI cabinet assembly (Figure 2, Item 3).

END OF TASK

BII/COEI CABINET ASSEMBLY LID AND HINGE DISASSEMBLY

NOTE

Note orientation of hardware and components to aid in installation.

1. Open BII/COEI cabinet assembly.
2. Remove gas springs IAW subtask in this WP.
3. Remove 19 screws (Figure 3, Item 3) and locknuts (Figure 3, Item 2) from BII/COEI cabinet. Discard locknuts.
4. Remove lid (Figure 3, Item 1) and hinge (Figure 3, Item 4) from cabinet.
5. Remove 17 screws (Figure 3, Item 3) and locknuts (Figure 3, Item 2) from BII/COEI lid (Figure 3, Item 1) and remove hinge (Figure 3, Item 4). Discard locknuts.

BII/COEI CABINET ASSEMBLY LID AND HINGE DISASSEMBLY - Continued

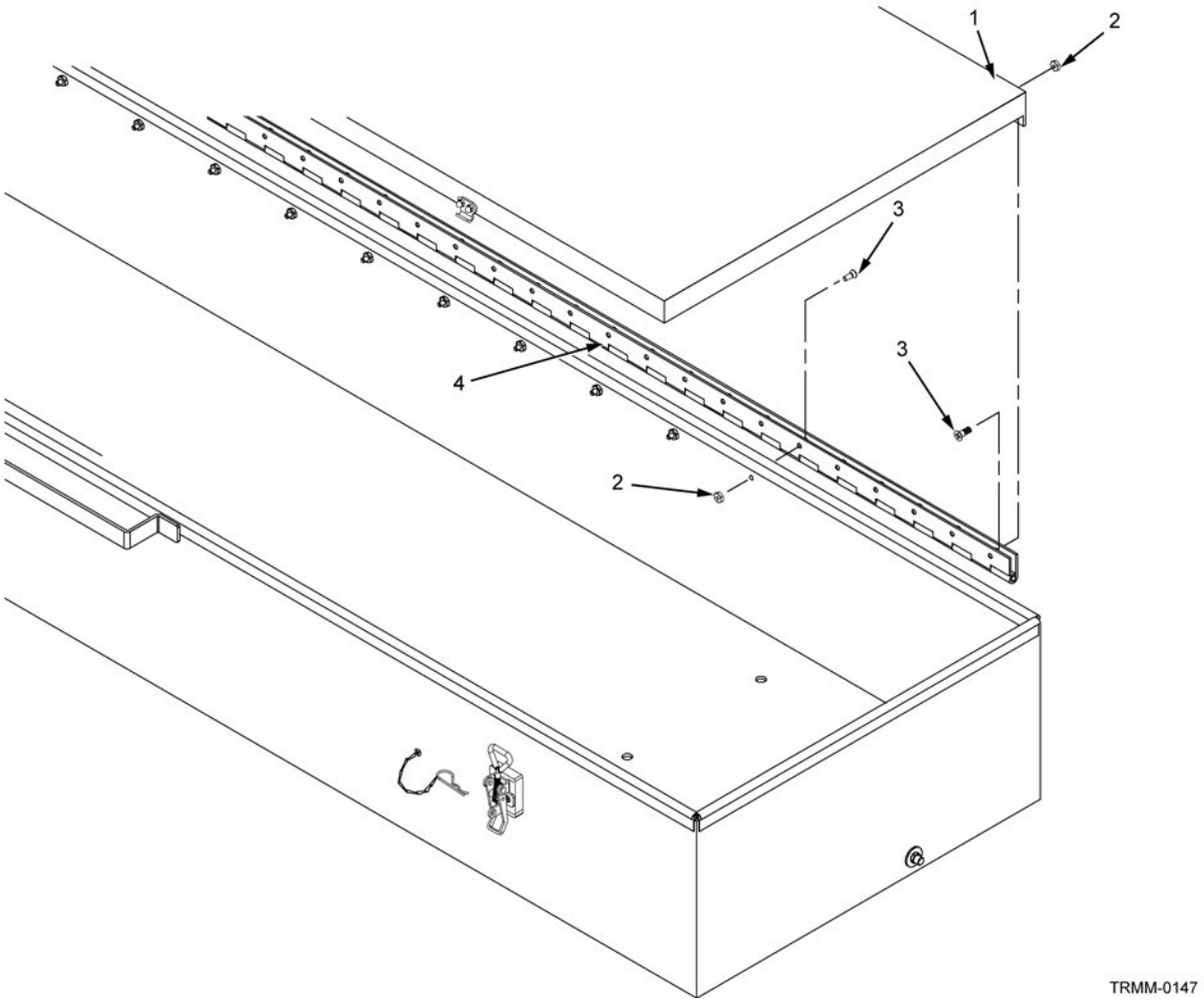


Figure 3. BII/COEI Cabinet Assembly Hinge.

END OF TASK

BII/COEI CABINET ASSEMBLY LID AND HINGE ASSEMBLY

1. Install hinge on BII/COEI lid using 17 screws (Figure 3, Item 3) and new locknuts (Figure 3, Item 2).
2. Install hinge (Figure 3, Item 4) and BII/COEI lid (Figure 3, Item 1) on BII/COEI cabinet using 19 screws (Figure 3, Item 3) and new locknuts (Figure 3, Item 2).
3. Install gas springs IAW with subtask in this WP.
4. Close BII/COEI cabinet assembly.

END OF TASK

BII/COEI CABINET GASKET DISASSEMBLY

1. Remove BII/COEI cabinet from MFS TRM (WP 0120).

BII/COEI CABINET GASKET DISASSEMBLY - Continued

2. Open BII/COEI cabinet assembly (Figure 4, Item 2).
3. Remove four clips (Figure 4, Item 6) from two gas springs (Figure 4, Item 4) at lid.
4. Remove two gas springs (Figure 4, Item 4) from four mounting studs (Figure 4, Items 3 and 5).
5. Remove box edge seal gasket (Figure 4, Item 1).
6. Remove remaining residual gasket material.

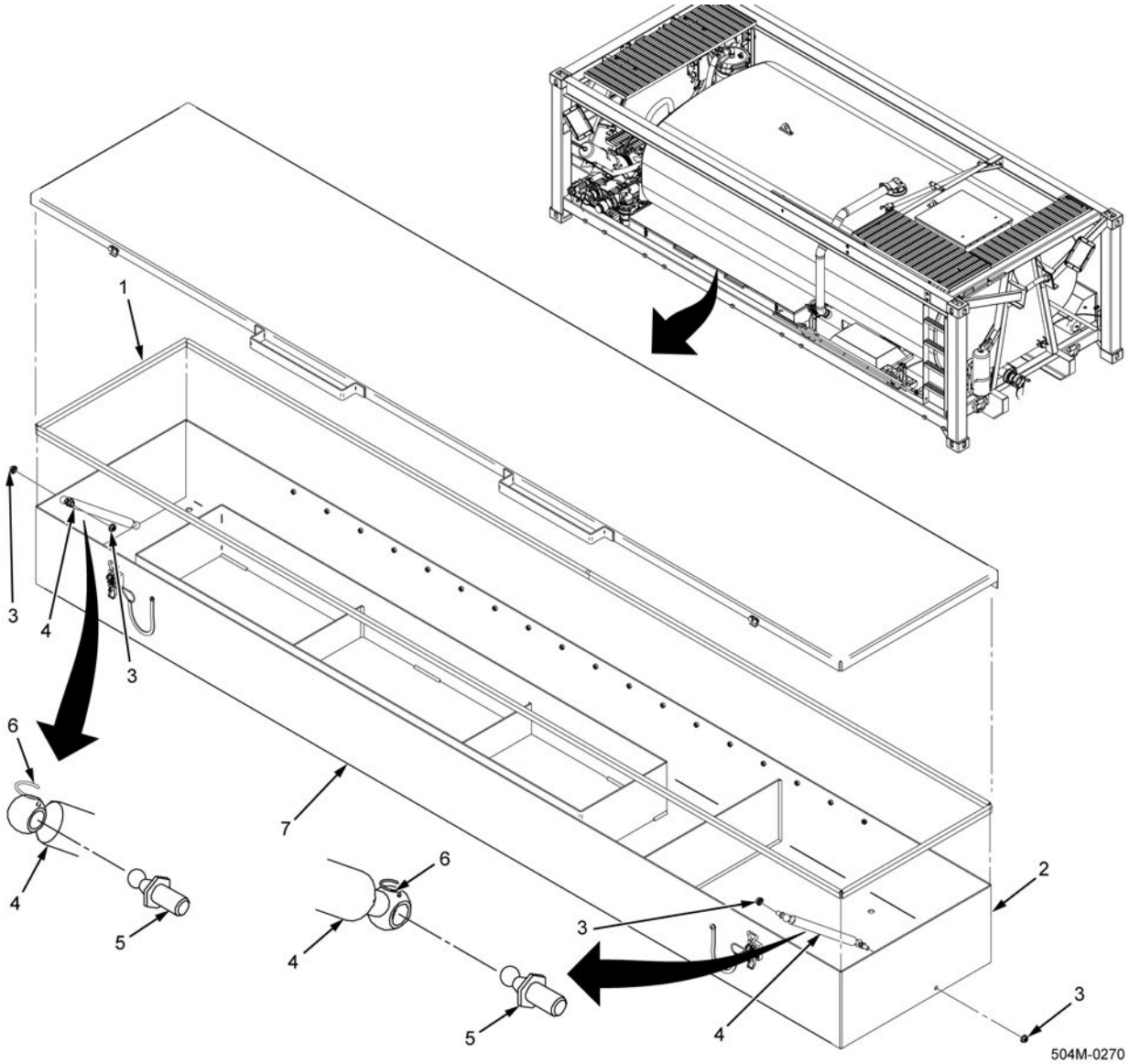


Figure 4. BII/COEI Cabinet Assembly Gasket.

END OF TASK

BII/COEI CABINET GASKET ASSEMBLY

WARNING

- Ensure work is completed in a well-ventilated, non-enclosed space.
- Do not sand, grind, or heat surface of MFS TRM. Failure to comply could result in injury or death to personnel.

1. Mark the center of the length of the box on the back edge.
2. Apply adhesive to the top edge of the BII/COEI cabinet (Figure 4, Item 2).
3. Install gasket (Figure 4, Item 1) starting at mark on back edge.
4. End gasket (Figure 4, Item 1) at mark on back edge. Cut excess gasket if necessary.
5. Install two gas springs (Figure 4, Item 4) and secure with four clips (Figure 4, Item 6).
6. Close BII/COEI cabinet assembly (Figure 4, Item 2).
7. Install BII/COEI cabinet on MFS TRM (WP 0120).

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
MFS TRM TO HEMTT HOSE REPAIR

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposable nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)

Materials/Parts
- Absorbent material (WP 0216, Table 1, Item 1)
- Cleaning compound, solvent (WP 0216, Table 1, Item 3)
- Cloth, cleaning (WP 0216, Table 1, Item 4)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer

References

Equipment Condition
- MFS TRM grounded (TM 10-4930-371-10)

Time to Complete
- 0.5 Hour(s)

DISASSEMBLY

1. Remove dust cap (Figure 1, Item 5) from hose (Figure 1, Item 1).
2. Remove dust plug (Figure 1, Item 3) from hose (Figure 1, Item 1).
3. Remove two gaskets (Figure 1, Item 2). Discard gaskets.
4. Remove two chains with split rings (Figure 1, Item 4) from dust cap (Figure 1, Item 5) and dust plug (Figure 1, Item 3).

END OF TASK

CLEANING

WARNING

Solvent cleaning compound MIL-PRF-680 Type III is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Keep away from open flames and other sources of ignition. Failure to comply may cause injury to personnel.

1. Use solvent cleaning compound and cleaning cloth to remove debris from components.
2. Allow components to air dry.

END OF TASK

ASSEMBLY

1. Install two chains with split rings (Figure 1, Item 4) on dust cap (Figure 1 Item 5) and dust plug (Figure 1, Item 3).
2. Install two new gaskets (Figure 1, Item 2).
3. Install dust cap (Figure 1, Item 5).
4. Install dust plug (Figure 1, Item 3).

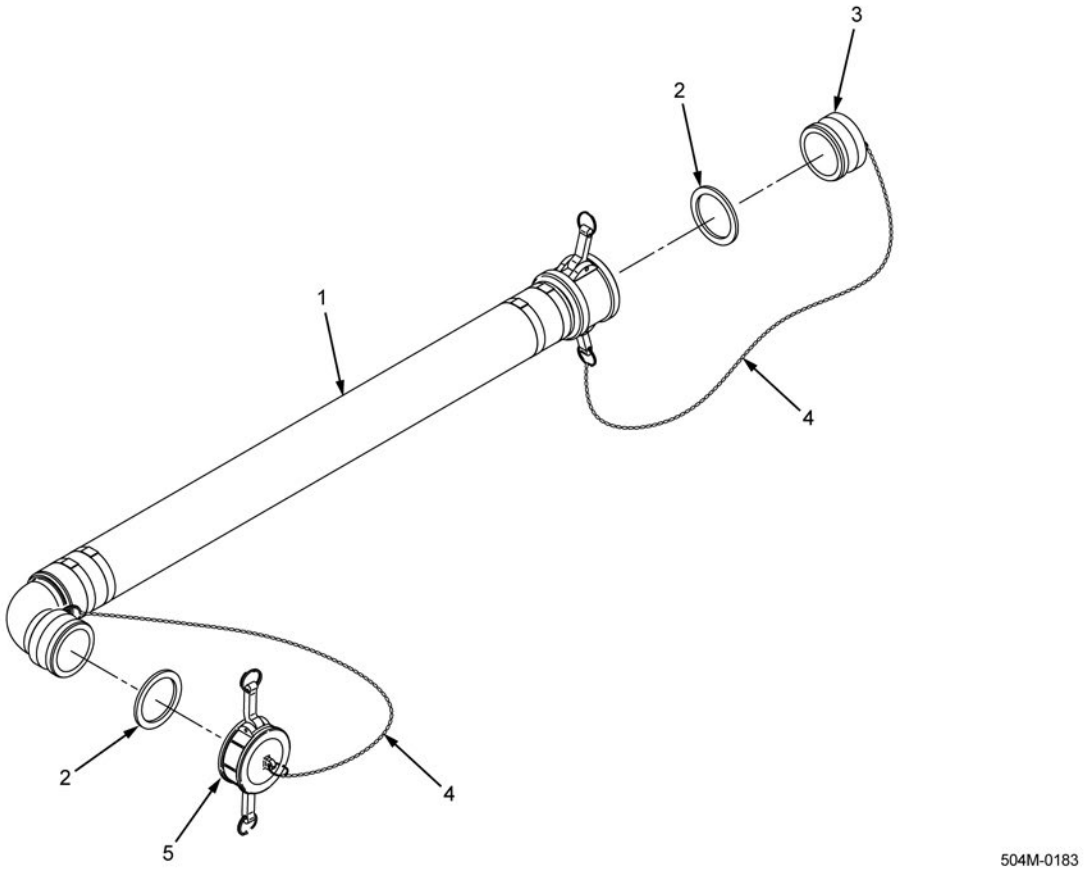


Figure 1. MFS TRM to HEMTT Hose Repair.

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
2-INCH HOSE ASSEMBLY REPAIR

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposable nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)
- Pan, drip (WP 0217, Table 1, Item 8)

Materials/Parts
- Absorbent material (WP 0216, Table 1, Item 1)
- Cleaning compound, solvent (WP 0216, Table 1, Item 3)
- Cloth, cleaning (WP 0216, Table 1, Item 4)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer

References
- ATP 4-43

Equipment Condition
- MFS TRM grounded (TM 10-4930-371-10)
- MFS TRM shut down (TM 10-4930-371-10)

Time to Complete
- 0.3 Hour(s)

DISASSEMBLY

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Use a drip pan to collect leaking fuel. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.

1. Place a drip pan under hose.
2. Twist two dust caps (Figure 1, Item 1) counterclockwise to remove from coupling assembly (Figure 1, Item 5).
3. Remove two dust cap seals (Figure 1, Item 2). Discard seals.
4. Remove two coupling seals (Figure 1, Item 3). Discard seals.
5. Remove two bumpers (Figure 1, Item 4). Discard bumpers.

DISASSEMBLY - Continued

6. Remove cap (Figure 1, Item 1), lanyard (Figure 1, Item 6), and split ring (Figure 1, Item 7) from coupling assembly (Figure 1, Item 5).

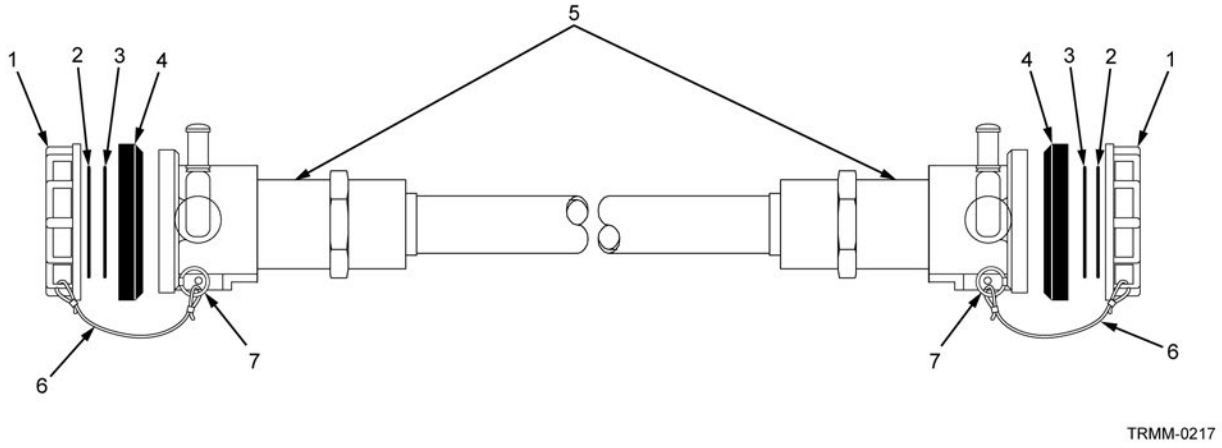


Figure 1. Repairing 2-Inch Hose Assembly.

END OF TASK

CLEANING

WARNING

Solvent cleaning compound MIL-PRF-680 Type III is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Keep away from open flames and other sources of ignition. Failure to comply may cause injury to personnel.

1. Clean all metal parts with a cleaning cloth and solvent cleaning compound.
2. Allow parts to dry thoroughly.

END OF TASK

ASSEMBLY

1. Install cap (Figure 1, Item 1), lanyard (Figure 1, Item 6), and split ring (Figure 1, Item 7) on coupling assembly (Figure 1, Item 5).
2. Install two new bumpers (Figure 1, Item 4).
3. Install two new coupling seals (Figure 1, Item 3).
4. Install two new dust cap seals (Figure 1, Item 2).

ASSEMBLY - Continued

5. Install two dust caps (Figure 1, Item 1) by placing on coupling assembly (Figure 1, Item 5) and turning clockwise.

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
4-INCH HOSE ASSEMBLY REPAIR

INITIAL SETUP:

Tools and Special Tools
Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
Fire extinguisher (TM 10-4930-371-10)
Gloves, disposable nitrile (WP 0216, Table 1, Item 5)
Goggles, industrial (WP 0216, Table 1, Item 6)

Materials/Parts
Absorbent material (WP 0216, Table 1, Item 1)
Cleaning compound, solvent (WP 0216, Table 1, Item 3)
Cloth, cleaning (WP 0216, Table 1, Item 4)

Personnel Required
91J Quartermaster and Chemical Equipment Repairer

References
ATP 4-43

Equipment Condition
MFS TRM grounded (TM 10-4930-371-10)
MFS TRM shut down (TM 10-4930-371-10)

Time to Complete
0.3 Hour(s)

DISASSEMBLY

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Failure to comply could result in injury or death to personnel.

DISASSEMBLY - Continued

1. Remove dust cap (Figure 1, Item 3).
2. Remove dust plug (Figure 1, Item 1).
3. Remove two gaskets (Figure 1, Item 2). Discard gaskets.
4. Remove chains (Figure 1, Item 4) from dust cap (Figure 1, Item 3), and dust plug (Figure 1, Item 1).

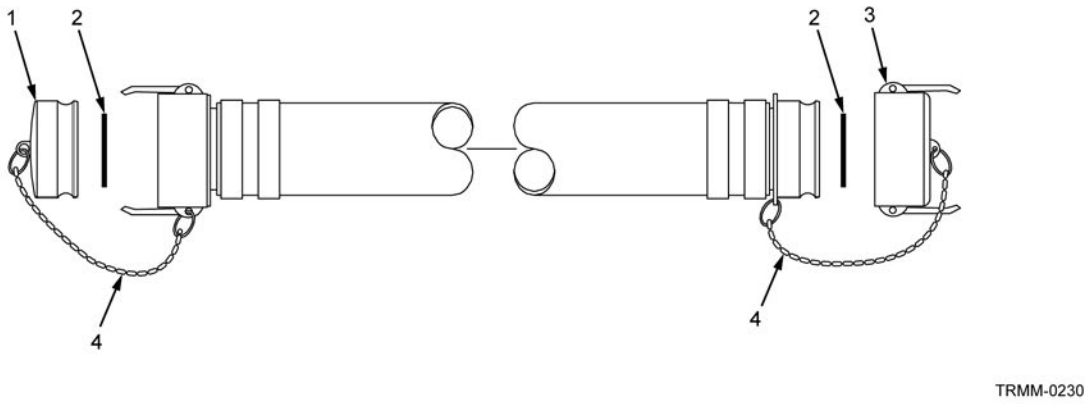


Figure 1. Reparing 4-Inch Hose Assembly.

END OF TASK

CLEANING

WARNING

Solvent cleaning compound MIL-PRF-680 Type III is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Keep away from open flames and other sources of ignition. Failure to comply may cause injury to personnel.

1. Use solvent cleaning compound and cleaning cloth to remove debris from components.
2. Allow components to dry thoroughly.

END OF TASK

ASSEMBLY

1. Install new chains (Figure 1, Item 4) on dust cap (Figure 1, Item 3) and dust plug (Figure 1, Item 1).
2. Install two new gaskets (Figure 1, Item 2).
3. Install dust cap (Figure 1, Item 3).

ASSEMBLY - Continued

4. Install dust plug (Figure 1, Item 1).

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
FUEL NOZZLE REPAIR

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposable nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)
- Pan, drip (WP 0217, Table 1, Item 8)
- Vise, machinist's (WP 0217, Table 1, Item 14)
- Wrench, adjustable, automotive (WP 0217, Table 1, Item 17)
- Wrench, internal pipe (WP 0217, Table 1, Item 18)

Materials/Parts
- Absorbent material (WP 0216, Table 1, Item 1)
- Cleaning compound, solvent (WP 0216, Table 1, Item 3)

Materials/Parts (cont.)
- Cloth, cleaning (WP 0216, Table 1, Item 4)
- Thread sealing compound (WP 0216, Table 1, Item 15)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer

References
- ATP 4-43

Time to Complete
- 0.5 Hour(s)

DISASSEMBLY

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Use a drip pan to collect leaking fuel. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.

DISASSEMBLY - Continued

NOTE

Note orientation of hardware and components to aid in installation.

1. Place fuel nozzle (Figure 1, Item 1) in vise.
2. While holding hexagon on bushing (Figure 1, Item 3), remove coupling (Figure 1, Item 7) from fuel nozzle (Figure 1, Item 1).
3. Remove bushing (Figure 1, Item 3) from fuel nozzle (Figure 1, Item 1).
4. Remove nipple (Figure 1, Item 2).
5. Remove cap (Figure 1, Item 6), lanyard (Figure 1, Item 4), and split ring (Figure 1, Item 5).

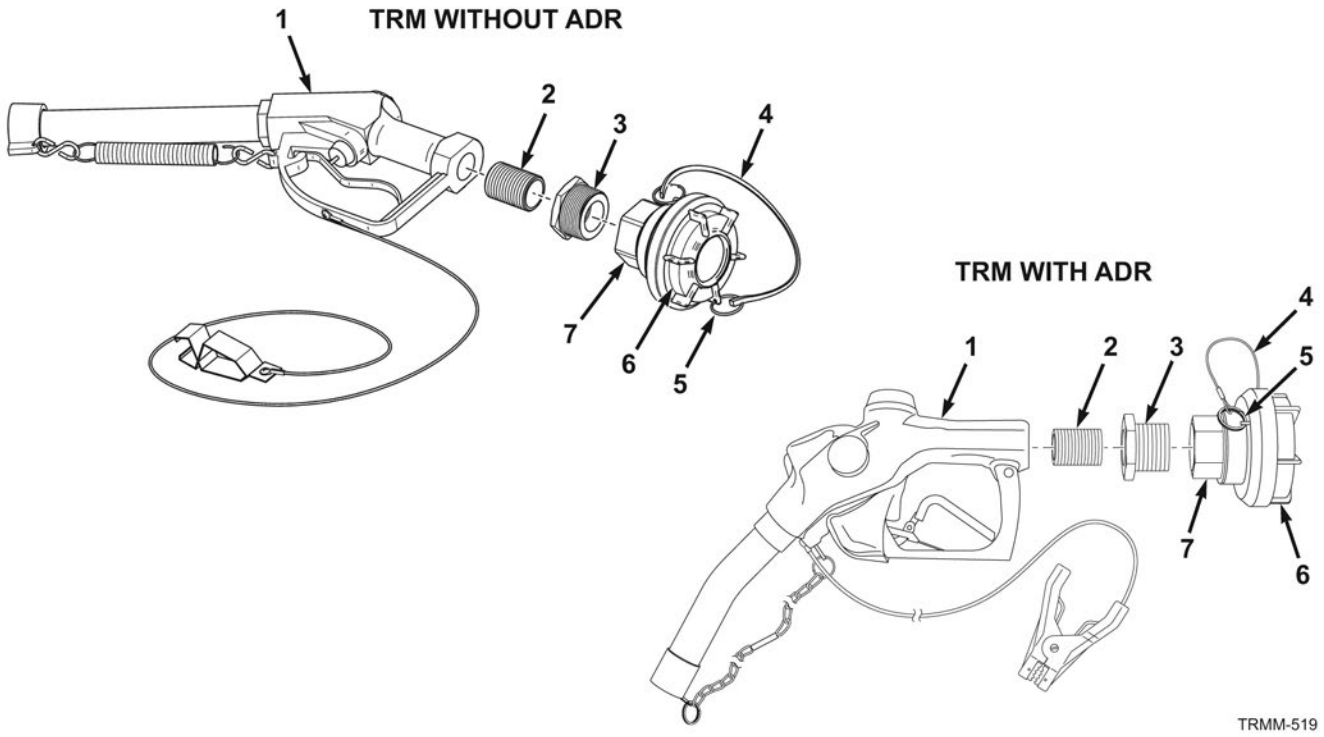


Figure 1. Fuel Nozzle.

END OF TASK

CLEANING

WARNING

Solvent cleaning compound MIL-PRF-680 Type III is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Keep away from open flames and other sources of ignition. Failure to comply may cause injury to personnel.

1. Clean all threads. Remove all buildup of dirt, oil, and debris from threads.
2. Clean all metal parts with a cleaning cloth and solvent cleaning compound.
3. Allow all parts to dry thoroughly.

END OF TASK

ASSEMBLY

WARNING

Thread sealing compound is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Failure to comply may cause injury to personnel.

CAUTION

Once tightened, do not turn connections counterclockwise. Air leaks will be created and can cause leaks. Damage to equipment could occur.

1. Apply thread sealing compound to fuel nozzle and end of nipple (Figure 1, Item 2). Loosely install nipple (Figure 1, Item 2) into fuel nozzle (Figure 1, Item 1).
2. Apply thread sealing compound on nipple. Loosely install bushing (Figure 1, Item 3) on nipple (Figure 1, Item 2).
3. Apply thread sealing compound on bushing. Install and tighten coupling (Figure 1, Item 7) on bushing (Figure 1, Item 3).
4. Install cap (Figure 1, Item 6), lanyard (Figure 1, Item 4), and split ring (Figure 1, Item 5) on coupling (Figure 1, Item 7).

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
GROUND STRAPS REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Multimeter, digital (WP 0217, Table 1, Item 6)
- Static cable (WP 0217, Table 1, Item 1)
- Wrench, socket impact, 1/2" drive, 6 pt, deep, 15/16" (WP 0217, Table 1, Item 20)
- Wrench, torque, 20 to 100 lb-ft (WP 0217, Table 1, Item 23)
- Wrench, torque, 250 lb-ft (WP 0217, Table 1, Item 22)

Materials/Parts
- Nut, self-locking, hexagon (LOCKNUTS) (WP 0164, Figure 18, Item 6)
- Nut, self-locking, hexagon (LOCKNUTS) (WP 0165, Figure 19, Item 7)
- Nut, self-locking, hexagon (LOCKNUTS) Qty: 2 (WP 0166, Figure 20, Item 6)
- Nut, self-locking, hexagon (LOCKNUTS) (WP 0173, Figure 27, Item 12)
- Nut, self-locking, hexagon (LOCKNUTS) Qty: 2 (WP 0183, Figure 37, Item 3)
- Nut, self-locking, hexagon (LOCKNUTS) Qty: 2 (WP 0208, Figure 62, Item 5)
- Washer, lock internal tooth Qty: 2 (WP 0164, Figure 18, Item 4)
- Washer, lock internal tooth Qty: 2 (WP 0165, Figure 19, Item 8)
- Washer, lock internal tooth Qty: 4 (WP 0166, Figure 20, Item 4)
- Washer, lock internal tooth Qty: 2 (WP 0173, Figure 27, Item 10)

Materials/Parts (cont.)
- Washer, lock internal tooth Qty: 4 (WP 0183, Figure 37, Item 4)
- Washer, lock internal tooth Qty: 2 (WP 0205, Figure 59, Item 35)
- Washer, lock internal tooth Qty: 2 (WP 0208, Figure 62, Item 7)
- Ground Strap, Filter/Separator (WP 0205, Figure 59, Item 36)
- Ground Strap, Static Reel (WP 0208, Figure 62, Item 6)
- Ground Strap, Ports D and E Qty: 2 (WP 0183, Figure 37, Item 9)
- Ground Strap, Pump (WP 0173, Figure 27, Item 13)
- Ground Strap, Tank to Frame (ADR only) (WP 0209.1, Figure 63.1, Item 2)
- Washer, lock internal tooth (ADR only) Qty: 2 (WP 0209.1, Figure 63.1, Item 3)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer (2)

Equipment Condition
- MFS TRM grounded (TM 10-4930-371-10)
- MFS TRM shut down (TM 10-4930-371-10)

Time to Complete
- 0.5 Hour(s)

PORT E GROUND STRAP REMOVAL

NOTE

Note orientation of hardware and components to aid in installation.

1. Remove one bolt (Figure 1, Item 6), two internal lock washers (Figure 1, Item 1), one grating clasp (Figure 1, Item 3) and locknut (Figure 1, Item 2). Discard locknut and internal lock washers.
2. Remove one bolt (Figure 1, Item 4), two internal lock washers (Figure 1, Item 1) one grating clasp (Figure 1, Item 3) and locknut (Figure 1, Item 2) and remove ground strap (Figure 1, Item 5). Discard locknut, internal lock washers, and ground strap.

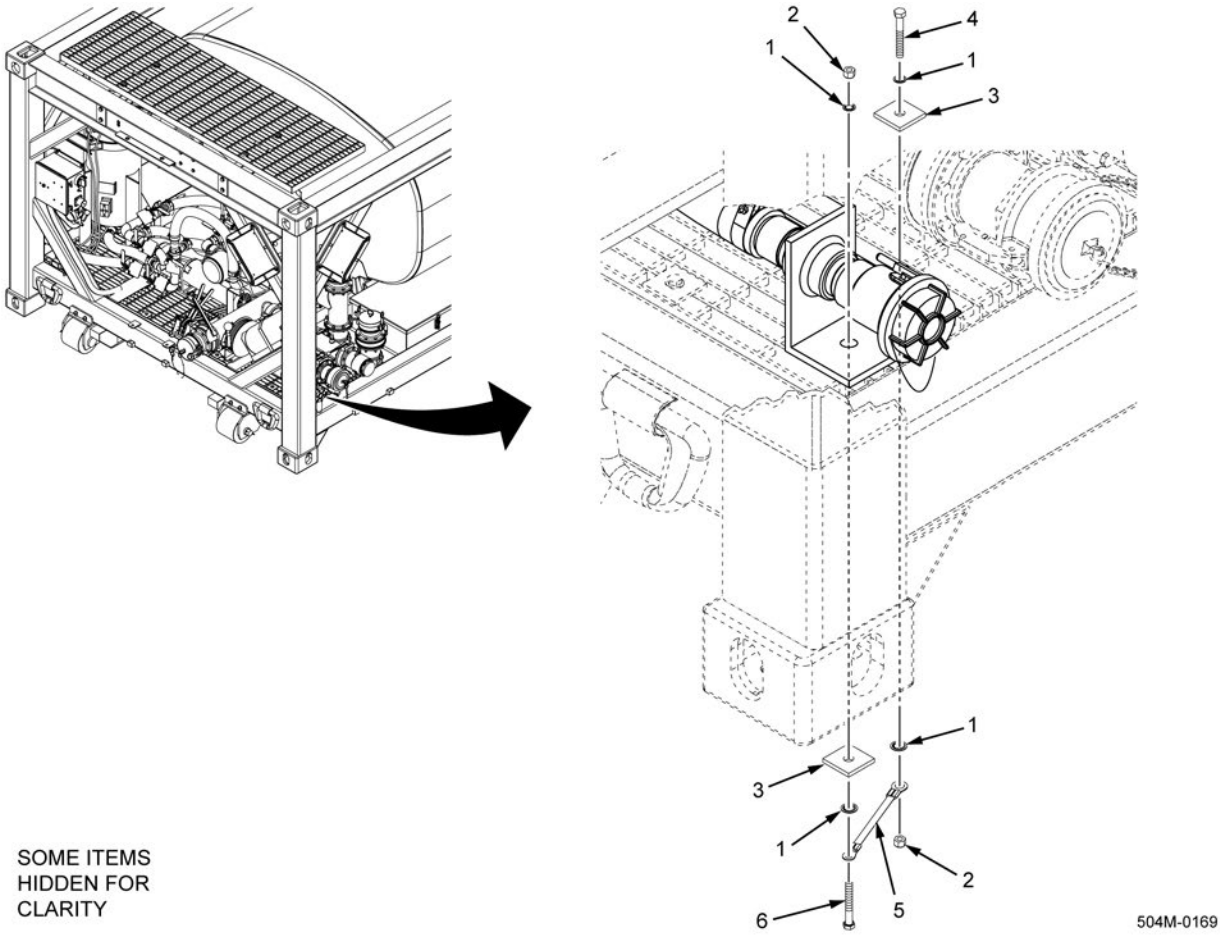


Figure 1. Port E Ground Strap.

END OF TASK

PORT E GROUND STRAP INSTALLATION

1. Install one bolt (Figure 1, Item 4), two new internal lock washers (Figure 1, Item 1), one grating clasp (Figure 1, Item 3), new ground strap (Figure 1, Item 5) and new locknut (Figure 1, Item 2).
2. Install one bolt (Figure 1, Item 6), new ground strap (Figure 1, Item 5), two new internal lock washers (Figure 1, Item 1), one grating clasp (Figure 1, Item 3) and new locknut (Figure 1, Item 2).

END OF TASK

STATIC REEL GROUND STRAP REMOVAL

WARNING

Ensure alternate grounding source is connected to grounding source before removing static reel. Failure to do so may result in injury or death to personnel.

NOTE

- Ensure metal to metal contact between MFS TRM and grounding source.
- Note orientation of hardware and components to aid in installation.

1. Ensure continuity of alternate grounding cable is equal to or less than 10 ohms then attach to MFS TRM.

NOTE

Bonding clamp cable terminal (Figure 2, Item 6) is present only on TRM with ADR.

2. Remove one bolt (Figure 2, Item 1), two internal lock washers (Figure 2, Item 2), one grating clasp (Figure 2, Item 3), locknut (Figure 2, Item 7), bonding clamp cable terminal (Figure 2, Item 6), and ground strap (Figure 2, Item 5) from static reel (Figure 2, Item 4). Discard locknut and internal lock washers.
3. Remove one bolt (Figure 2, Item 1), two internal lock washers (Figure 2, Item 2), one grating clasp (Figure 2, Item 3), locknut (Figure 2, Item 7) and remove ground strap (Figure 2, Item 5). Discard locknut, internal lock washers, and ground strap.

STATIC REEL GROUND STRAP REMOVAL - Continued

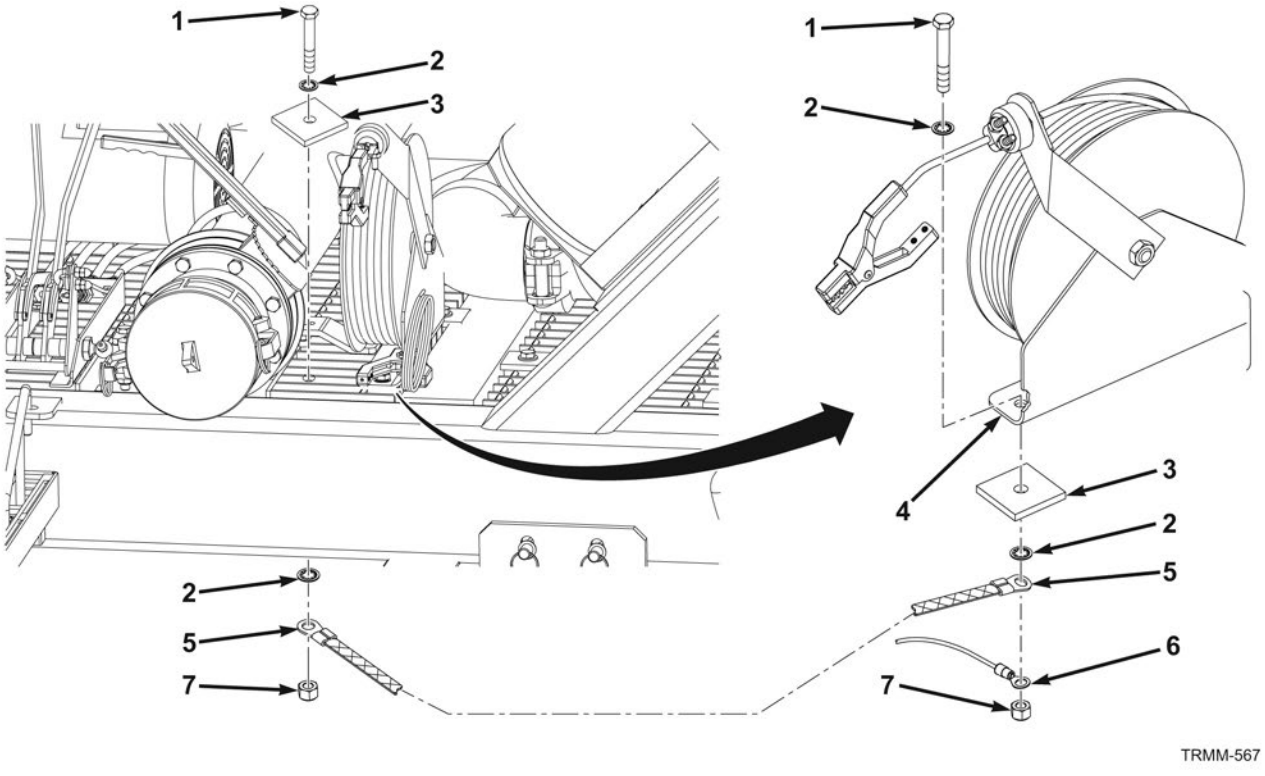


Figure 2. Static Reel Ground Strap.

END OF TASK

STATIC REEL GROUND STRAP INSTALLATION

1. Install one bolt (Figure 2, Item 1), two new internal lock washers (Figure 2, Item 2), one grating clasp (Figure 2, Item 3), new ground strap (Figure 2, Item 5) and new locknut (Figure 2, Item 7).

NOTE

Bonding clamp cable terminal (Figure 2, Item 6) is present only on TRM with ADR.

2. Install one bolt (Figure 2, Item 1), two new internal lock washers (Figure 2, Item 2), one grating clasp (Figure 2, Item 3), new ground strap (Figure 2, Item 5), bonding clamp cable terminal (Figure 2, Item 6), and new locknut (Figure 2, Item 7) on static reel (Figure 2, Item 4).
3. Remove alternate ground cable.

END OF TASK

PUMP GROUND STRAP REMOVAL

NOTE

Note orientation of hardware and components to aid in installation.

PUMP GROUND STRAP REMOVAL - Continued

1. Remove one bolt (Figure 3, Item 3), two internal lock washers (Figure 3, Item 4), one grating clasp (Figure 3, Item 5) and one locknut (Figure 3 Item 6). Discard locknut and internal lock washers.
2. Remove one bolt (Figure 3, Item 2), two internal lock washers (Figure 3, Item 1), one locknut (Figure 3, Item 6) and remove ground strap (Figure 3, Item 7). Discard locknut, internal lock washers, and ground strap.

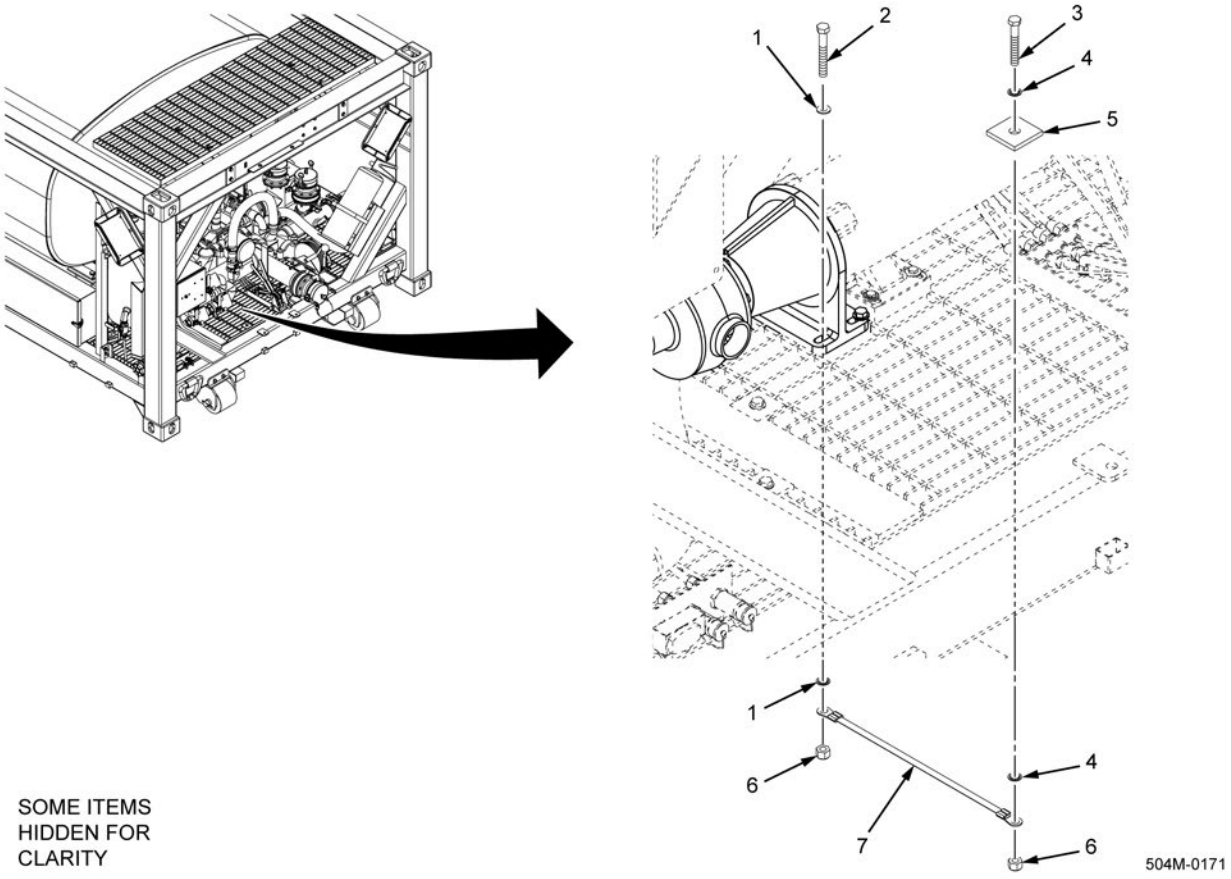


Figure 3. Pump Ground Strap.

END OF TASK

PUMP GROUND STRAP INSTALLATION

1. Install one bolt (Figure 3, Item 2), two new internal lock washers (Figure 3 Item 1), new ground strap (Figure 3, Item 7) and new locknut (Figure 3, Item 6).
2. Install one bolt (Figure 3, Item 3), two new internal lock washers (Figure 3, Item 4), one grating clasp (Figure 3, Item 5), new ground strap (Figure 3, Item 7) and new locknut (Figure 3, Item 6).

END OF TASK

PORT D AND FILTER/SEPARATOR GROUND STRAP REMOVAL

NOTE

Note orientation of hardware and components to aid in installation.

1. Remove one bolt (Figure 4, Item 4), two internal lock washers (Figure 4, Item 5), one grating clasp (Figure 4, Item 6) and locknut (Figure 4, Item 7). Discard locknut and internal lock washers.
2. Remove one bolt (Figure 4, Item 8), two internal lock washers (Figure 4, Item 5), one grating clasp (Figure 4, Item 6), locknut (Figure 4 Item 7) and remove ground strap (Figure 4, Item 9). Discard locknut, internal lock washers, and ground strap.
3. Remove one bolt (Figure 4, Item 3), two internal lock washers (Figure 4, Item 2), one square washer (Figure 4, Item 1), two nuts (Figure 4, Item 11) and remove ground strap (Figure 4, Item 10). Discard ground strap and internal lock washers.

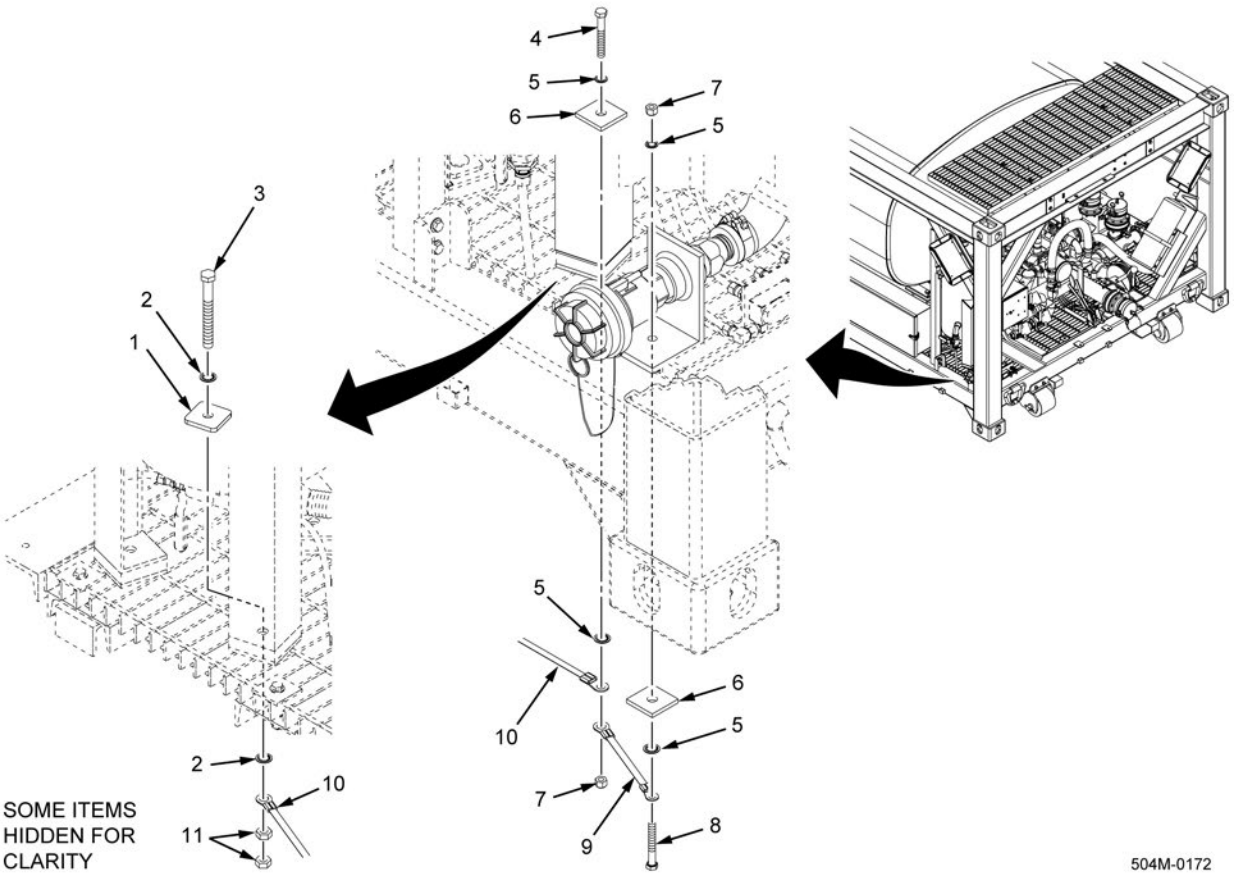


Figure 4. Port D Ground Strap.

END OF TASK

PORT D AND FILTER/SEPARATOR GROUND STRAP INSTALLATION

1. Install one bolt (Figure 4, Item 3), two new internal lock washers (Figure 4, Item 2), one square washer (Figure 4, Item 1), new ground strap (Figure 4, Item 10) and two nuts (Figure 4, Item 11).

PORT D AND FILTER/SEPARATOR GROUND STRAP INSTALLATION - Continued

2. Install one bolt (Figure 4, Item 8), new ground strap (Figure 4, Item 9), two new internal lock washers (Figure 4, Item 5), one grating clasp (Figure 4 Item 6) and new locknut (Figure 4, Item 7).
3. Install one bolt (Figure 4, Item 4), two new internal lock washers (Figure 4, Item 5), one grating clasp (Figure 4, Item 6), two new ground straps (Figure 4, Items 9 and 10) and new locknut (Figure 4, Item 7).

END OF TASK

TRM WITH ADR TANK TO FRAME GROUNDING STRAP REMOVAL

NOTE

Note orientation of hardware and components to aid in installation.

Remove bolt (Figure 5, Item 2), two external tooth lock washers (Figure 5, Item 3), ground strap (Figure 5, Item 6), and two nuts (Figure 5, Item 5) from tank bracket (Figure 5, Item 1) and angle bracket (Figure 5, Item 4). Discard ground strap and external tooth lock washers.

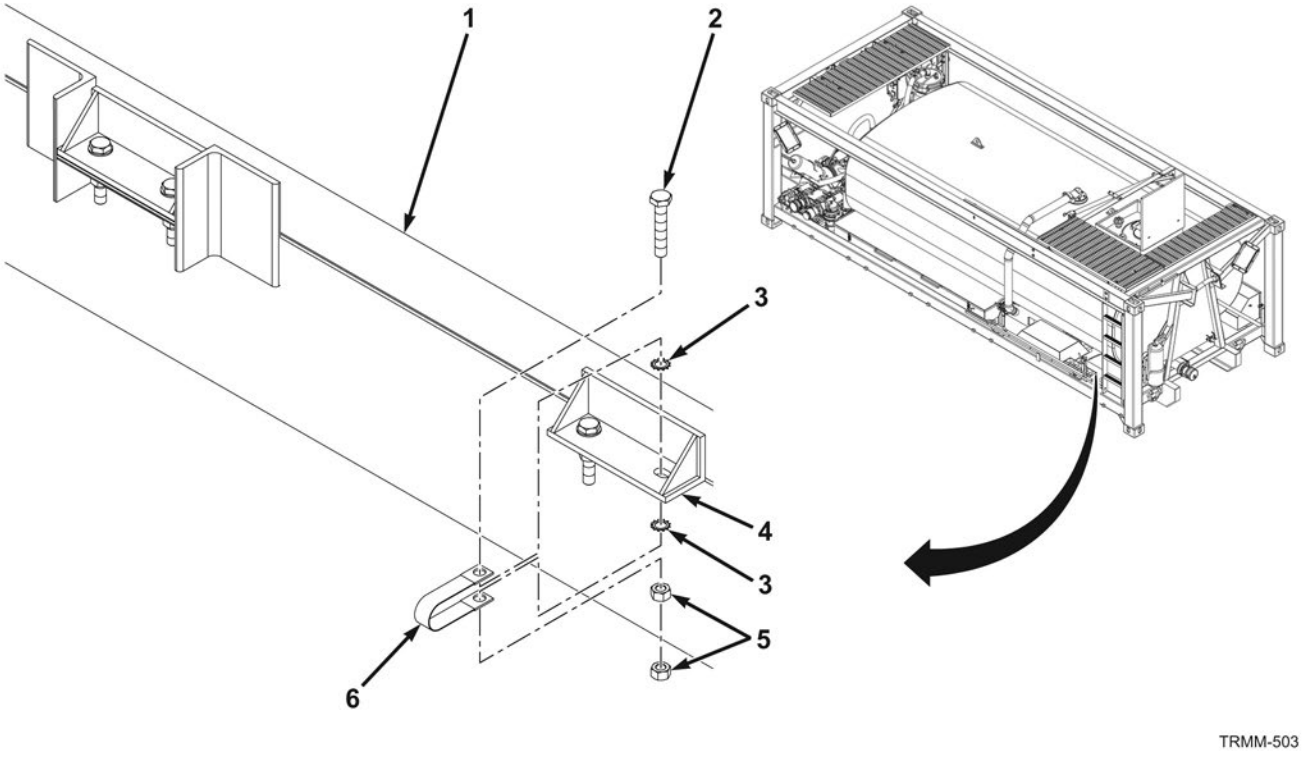


Figure 5. Tank to Frame Ground Strap.

END OF TASK

TRM WITH ADR TANK TO FRAME GROUNDING STRAP INSTALLATION

CAUTION

Do not apply CARC paint to the ground strap leads. The external tooth lock washer, when tightened, will go through the paint, embedding itself into the bare metal under the paint, grounding the unit.

1. Install new ground strap (Figure 5, Item 6) and new external tooth lock washer (Figure 5, Item 3) on bolt (Figure 5, Item 2).
2. Install bolt (Figure 5, Item 2) with new ground strap (Figure 5, Item 6) through tank bracket (Figure 5, Item 1) and angle bracket (Figure 5, Item 4).
3. Install new external tooth lock washer (Figure 5, Item 3) and new ground strap (Figure 5, Item 6) on bolt (Figure 5, Item 2), tank bracket (Figure 5, Item 1), and angle bracket (Figure 5, Item 4) with first nut (Figure 5, Item 5). Tighten nut to 200 ft-lbs (271.2 N·m).
4. Install second nut (Figure 5, Item 5) on bolt (Figure 5, Item 2). Tighten nut to 60 ft-lbs (81.3 N·m).

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
VAPOR RECOVERY LINE ASSEMBLY REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposable nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)
- Pan, drip (WP 0217, Table 1, Item 8)

Materials/Parts
- Absorbent material (WP 0216, Table 1, Item 1)
- Gasket (WP 0200, Figure 54, Item 2)
- Gasket (WP 0200, Figure 54, Item 9)
- Nut, self-locking, hexagon (LOCKNUTS) Qty: 8 (WP 0200, Figure 54, Item 5)
- Solvent, cleaning (WP 0216, Table 1, Item 3)
- Vapor Recovery Line (WP 0200, Figure 54, Item 4)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer (2)

References
- ATP 4-43

Equipment Condition
- MFS TRM grounded (TM 10-4930-371-10)
- MFS TRM shut down (TM 10-4930-371-10)

Time to Complete
- 1.0 Hour(s)

REMOVAL

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Use a drip pan to collect leaking fuel. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the Modular Fuel System Tank Rack Module (MFS TRM) prior to the transfer of fuel.
- Follow all fuel operations IAW ATP 4-43. Ensure grounding and bonding connections are made properly before any fueling operations. Stop fueling operations immediately at the first sign of a leak or malfunction.
- Wet metal surfaces are slippery. Use caution when climbing on top of MFS TRM.
- Ground self and equipment before any fueling operations to prevent explosion caused by electrostatic charge.
- Climbing on top of the MFS TRM presents a fall hazard. Use handrail assembly and handholds at all times and always use “three point contact” with the MFS TRM when climbing on top of the tank to avoid falls. “Three point contact” means that one hand and two feet, or two hands and one foot are in contact with the MFS TRM at all times when climbing on top of the tank. Failure to comply could result in injury or death to personnel.
- Failure to comply could result in injury or death to personnel.

1. Remove vapor recovery line dust cap (Figure 1, Item 2).
2. Momentarily open then close bottom loading valve (V1) (Figure 1, Item 1) to vent tank pressure.

REMOVAL - Continued

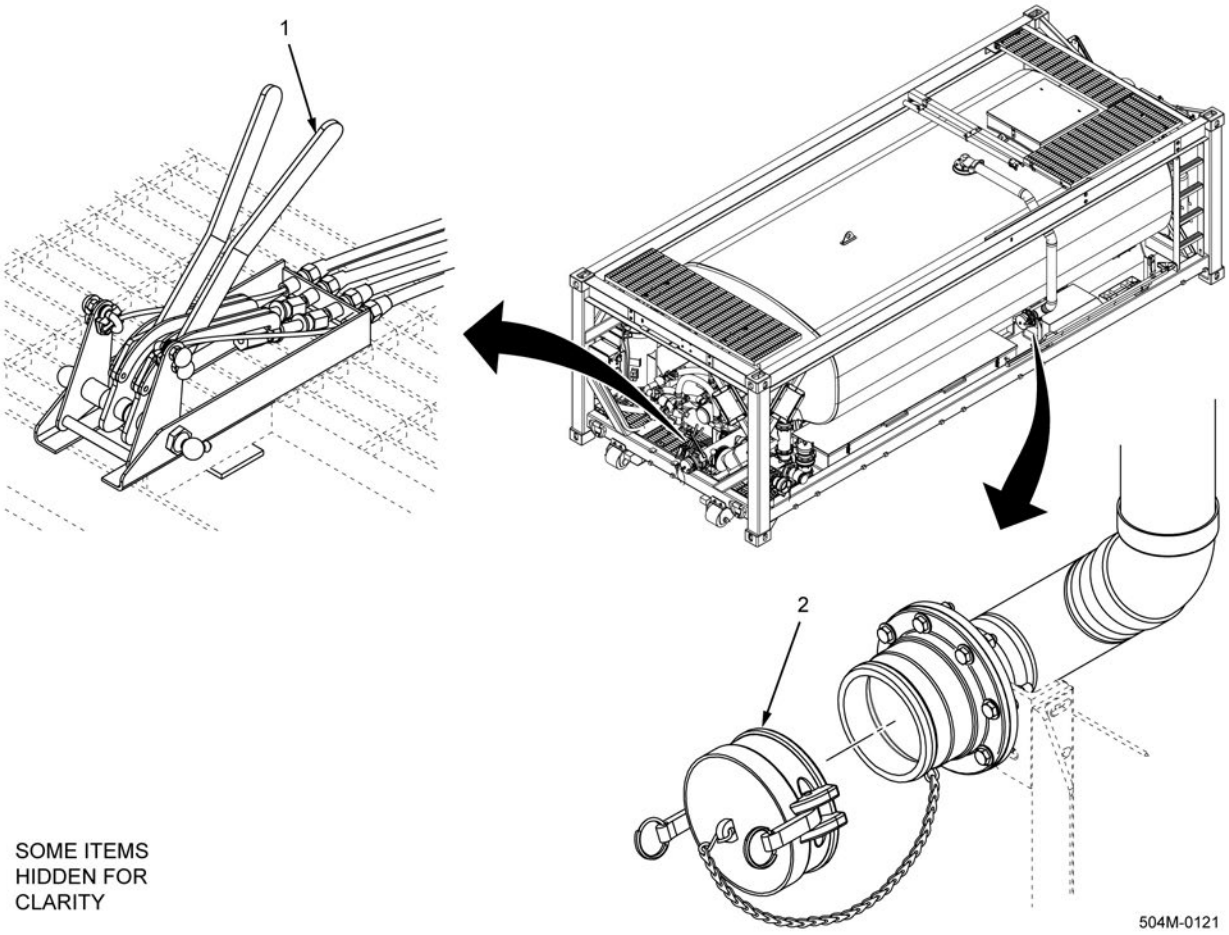


Figure 1. Fuel System Venting.

3. Open spillbox lid (Figure 2, Item 2).
4. Open manhole cover (Figure 2, Item 1) to relieve pressure.

REMOVAL - Continued

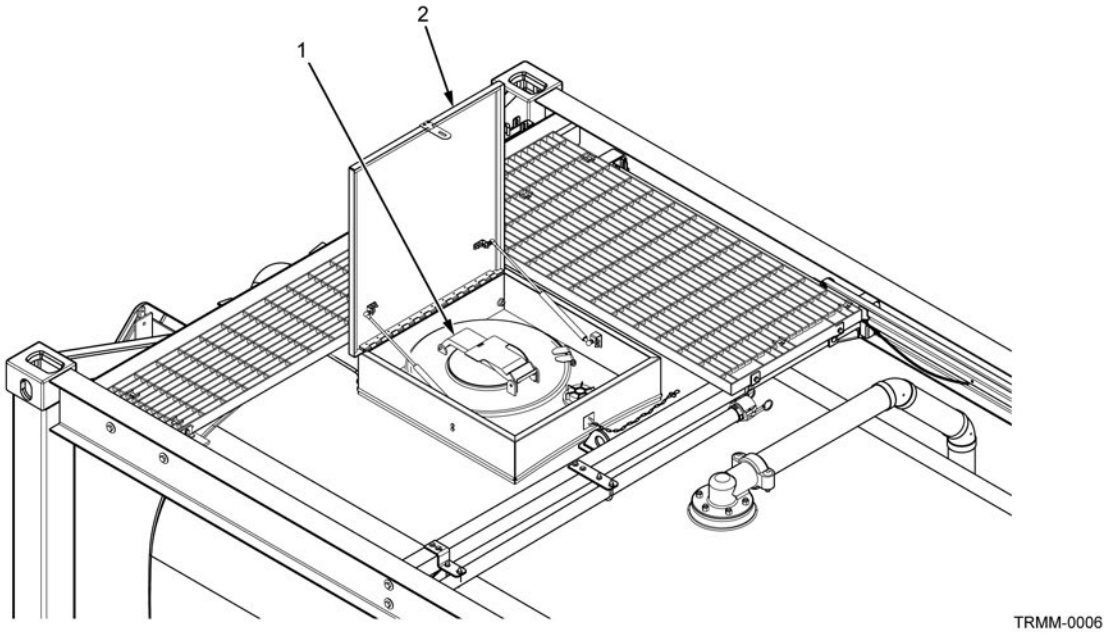


Figure 2. Opening Spillbox Lid and Manhole Cover.

5. Remove dust cap (Figure 3, Item 13) from coupling flange (Figure 3, Item 11).
6. Secure vapor recovery line (Figure 3, Item 5) to support its weight once attaching hardware is removed.
7. Remove two locknuts (Figure 3, Item 8), two flat washers (Figure 3, Item 7), and bolts (Figure 3, Item 12) securing coupling flange (Figure 3, Item 11) to bracket (Figure 3, Item 6). Discard locknuts.
8. Remove six locknuts (Figure 3, Item 15), bolts (Figure 3, Item 14), and remove coupling flange (Figure 3, Item 11), and gasket (Figure 3, Item 10). Discard locknuts and gasket.
9. Remove two nuts (Figure 3, Item 2) and bolts (Figure 3, Item 16) from coupling halves (Figure 3, Item 3).
10. Remove coupling halves (Figure 3, Item 3) securing vapor recovery line (Figure 3, Item 5) to vent valve outlet (Figure 3, Item 1) and remove vapor recovery line (Figure 3, Item 5) as needed.
11. Remove and discard coupling gasket (Figure 3, Item 4).

REMOVAL - Continued

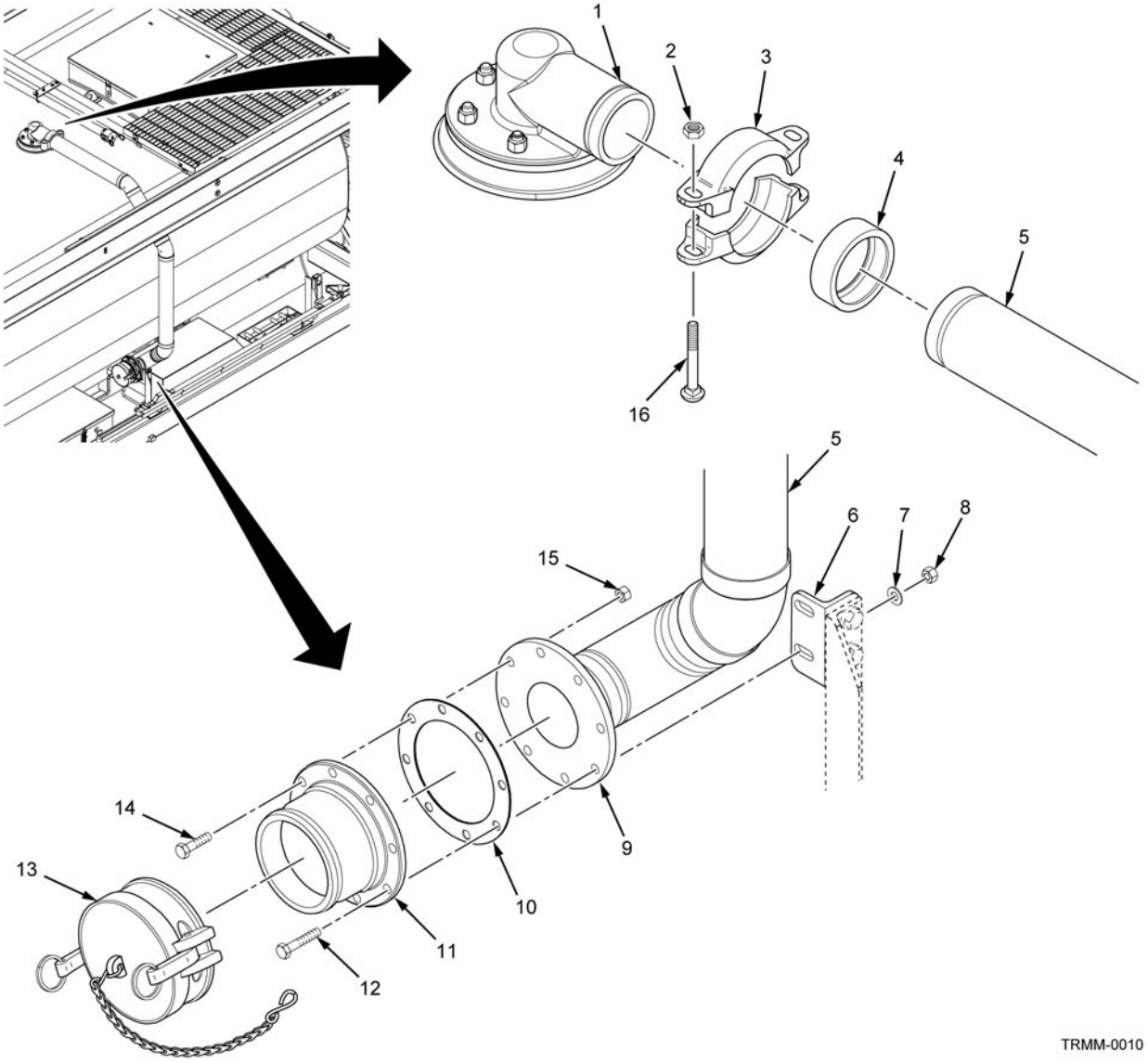


Figure 3. Replacing Vapor Recovery Assembly Components.

END OF TASK

CLEANING

WARNING

Solvent cleaning compound MIL-PRF-680 Type III is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Keep away from open flames and other sources of ignition. Failure to comply may cause injury to personnel.

1. Clean any residual gasket material from mating surfaces of pipe flange (Figure 3, Item 9) and coupling flange (Figure 3, Item 11).
2. Remove all buildup of dirt, oil, and debris.
3. Clean all metal parts with a cleaning cloth and solvent cleaning compound and allow parts to dry thoroughly.

END OF TASK

INSTALLATION

1. Lightly lubricate new coupling gasket (Figure 3, Item 4) with fuel.
2. Lift new vapor recovery line (Figure 3, Item 5) into position with vent valve outlet (Figure 3, Item 1). Support as needed.
3. Install new coupling gasket (Figure 3, Item 4) on new vapor recover line (Figure 3, Item 5). Slide gasket on vent valve outlet (Figure 3, Item 1) so that half remains on vapor recovery line (Figure 3, Item 5).
4. Install coupling halves (Figure 3, Item 3) to secure vapor recovery line (Figure 3, Item 5) to vent valve outlet (Figure 3, Item 1).
5. Install two nuts (Figure 3, Item 2) and two bolts (Figure 3, Item 16) to secure coupling halves (Figure 3, Item 3).
6. Install bracket (Figure 3, Item 6) and secure pipe flange (Figure 3, Item 9) and coupling flange (Figure 3, Item 11) together with new gasket (Figure 3, Item 10) and six new locknuts (Figure 3, Item 15) and six bolts (Figure 3, Item 14).
7. Secure pipe flange (Figure 3, Item 9) to bracket (Figure 3, Item 6) with two bolts (Figure 3, Item 12), two flat washers (Figure 3, Item 7), bracket and two new locknuts (Figure 3, Item 8).
8. Install dust cap (Figure 3, Item 13) to coupling flange (Figure 3, Item 11).
9. Close manhole cover (Figure 4, Item 1).
10. Close spillbox lid (Figure 4, Item 2).

INSTALLATION - Continued

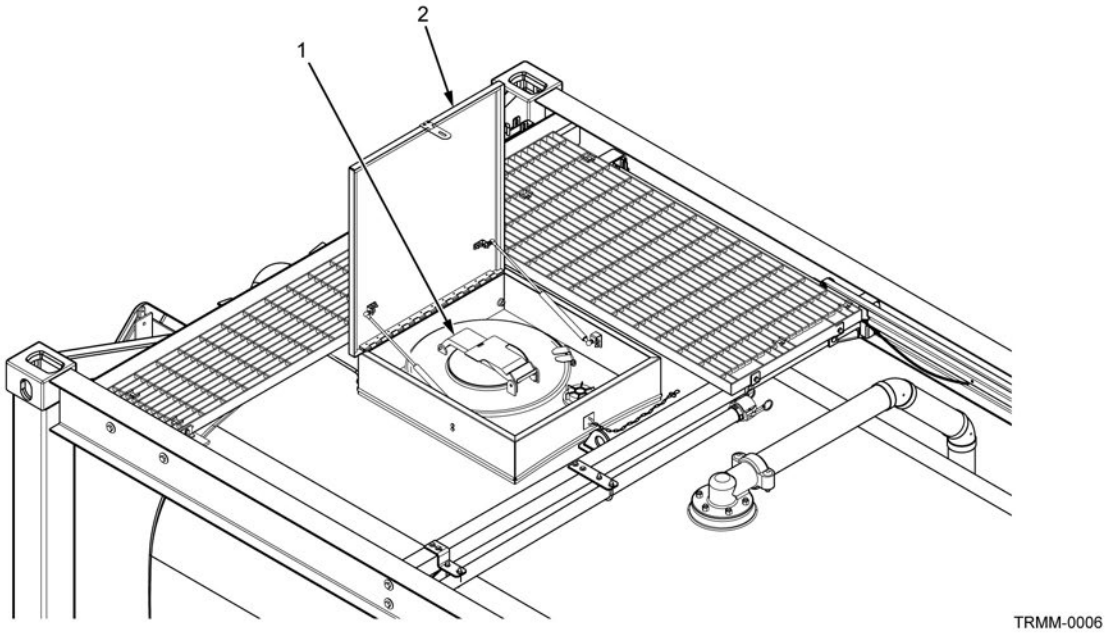


Figure 4. Closing Manhole Cover and Spillbox Lid.

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
STOWABLE LADDER REPAIR

INITIAL SETUP:

Tools and Special Tools
Tool kit, general mechanic's (WP 0217, Table 1, Item 13)

Equipment Condition
MFS TRM grounded (TM 10-4930-371-10)
MFS TRM shut down (TM 10-4930-371-10)

Personnel Required
91J Quartermaster and Chemical Equipment Repairer

Time to Complete
0.5 Hour(s)

References

DISASSEMBLY

NOTE

If stowable ladder bracket is damaged, replace as necessary.

1. Remove two bolts, (Figure 1, Item 6), locknuts (Figure 1, Item 8) and remove stowable ladder feet (Figure 1, Item 7). Discard locknuts.
2. Remove two bolts, (Figure 1, Item 3), spacer (Figure 1, Item 4), four flat washers (Figure 1, Item 2), two nuts (Figure 1, Item 1) and remove folding lock bar (Figure 1, Item 5).

END OF TASK

ASSEMBLY

1. Install two bolts, (Figure 1, Item 3), spacer (Figure 1, Item 4), four flat washers (Figure 1, Item 2), two nuts (Figure 1, Item 1), to secure folding lock bar (Figure 1, Item 5).
2. Install two bolts (Figure 1, Item 6) and new locknuts (Figure 1, Item 8) to secure stowable ladder feet (Figure 1, Item 7).

ASSEMBLY - Continued

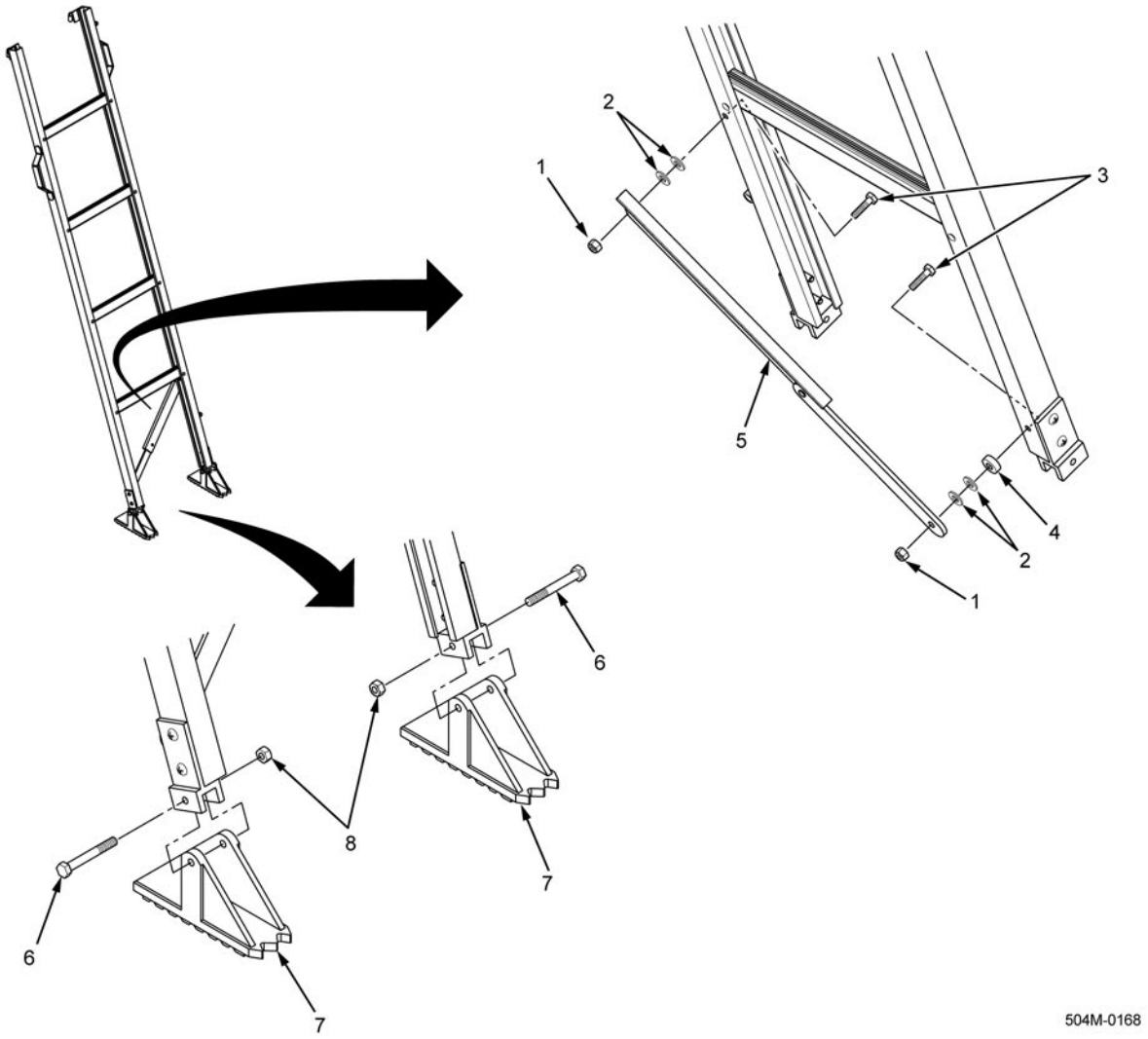


Figure 1. Stowable Ladder Assembly.

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
STEP ASSEMBLY, VEHICULAR (LADDER PLATFORM) REPAIR

INITIAL SETUP:

Tools and Special Tools
Tool kit, general mechanic's (WP 0217, Table 1, Item 13)

Personnel Required
91J Quartermaster and Chemical Equipment Repairer

References

Equipment Condition
MFS TRM grounded (TM 10-4930-371-10)

Time to Complete
0.5 Hour(s)

DISASSEMBLY

1. Remove four nuts (Figure 1, Item 4) securing two ladder platform hooks (Figure 1, Item 1) to ladder platform (Figure 1, Item 3).
2. Remove four nuts (Figure 1, Item 2) from ladder platform hooks (Figure 1, Item 1).

END OF TASK

ASSEMBLY

NOTE

Install nuts so that ladder platform is level with MFS TRM.

1. Install four nuts (Figure 1, Item 2) on ladder platform hooks (Figure 1, Item 1).
2. Install two ladder platform hooks (Figure 1, Item 1) and secure to ladder platform (Figure 1, Item 3) with four nuts (Figure 1, Item 4).

ASSEMBLY - Continued

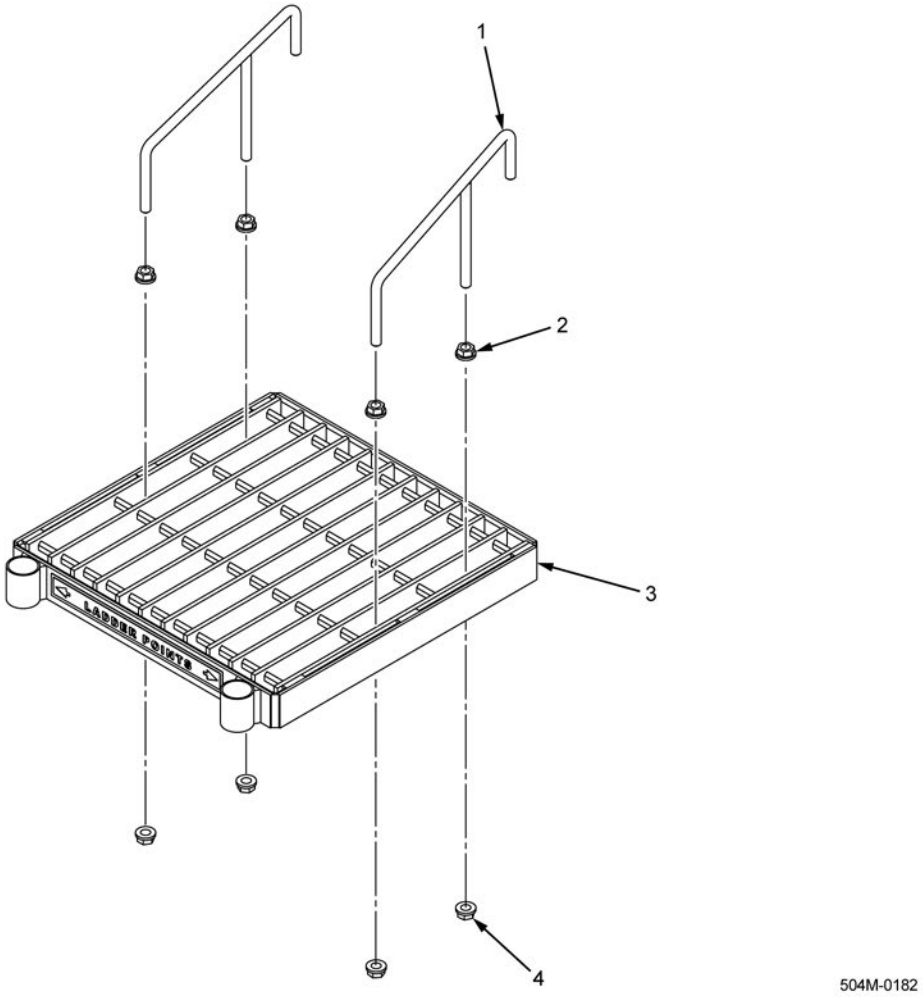


Figure 1. Step Assembly, Vehicular.

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
LADDER POINT ADAPTER REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Gloves, disposable nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)

Materials/Parts
- Adhesive, multi-purpose (WP 0216, Table 1, Item 2)
- Cleaning compound, solvent (WP 0216, Table 1, Item 3)
- Cloth, cleaning (WP 0216, Table 1, Item 4)
- Ladder point adapter kit (WP 0147, Figure 1, Item 6)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer

Equipment Condition
- MFS TRM grounded (TM 10-4930-371-10)
- MFS TRM shut down (TM 10-4930-371-10)

Time to Complete
- 0.5 Hour(s)

REMOVAL

NOTE

This work package is applicable to MFS TRMs with serial numbers 0001 through 0949 only.

1. Remove two screws (Figure 1, Item 3), washers (Figure 1, Item 2), ladder point adapter plate (Figure 1, Item 4), square washers (Figure 1, Item 7), spacers (Figure 1, Item 6), and locknuts (Figure 1, Item 8) from ladder point tubes (Figure 1, Item 1). Discard locknuts.

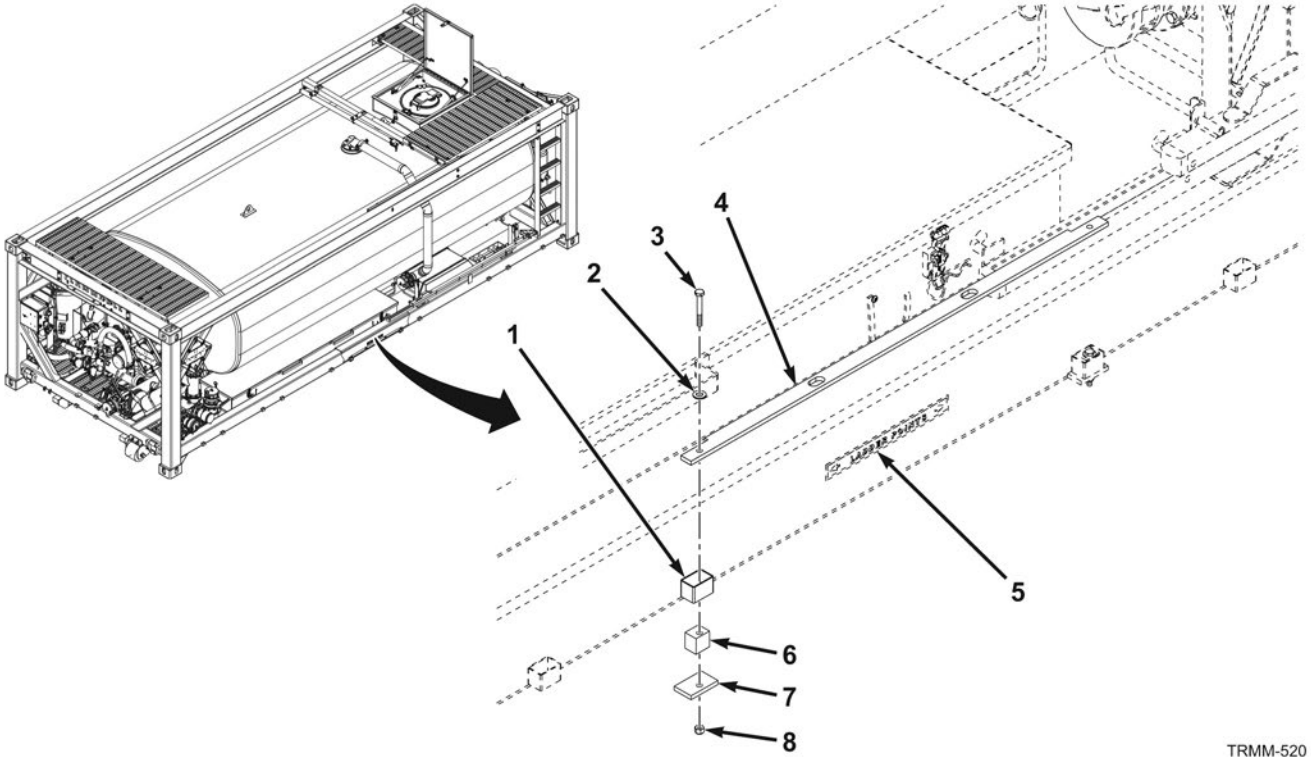


Figure 1. Ladder Point Adapter Replacement.

WARNING

Solvent cleaning compound MIL-PRF-680 Type III is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Keep away from open flames and other sources of ignition. Failure to comply may cause injury to personnel.

NOTE

Perform Step 2 only if ladder points label requires replacement.

REMOVAL - Continued

2. Remove ladder points label (Figure 1, Item 5) from frame. Clean surface of frame with cleaning compound and dry with clean rags.

END OF TASK

INSTALLATION

NOTE

Square washers should be positioned with short side flush with ladder point tube.

1. Install ladder point adapter plate (Figure 1, Item 4) on two ladder point tubes (Figure 1, Item 1) with two screws (Figure 1, Item 3), washers (Figure 1, Item 2), spacers (Figure 1, Item 6), square washers (Figure 1, Item 7), and new locknuts (Figure 1, Item 8).

WARNING

- Adhesive may cause irritation or discomfort to the eyes, skin, nose and throat and should not be ingested. Safety glasses, goggles, rubber gloves and aprons should be worn when handling. Clean-up materials and applicators should be recycled or disposed of IAW local protocol. Failure to comply may cause injury to personnel and damage to the environment.
- Do not sand or burn surfaces of MFS TRM. Failure to comply could result in death or serious injury.

NOTE

- Perform Step 2 only if ladder points label required replacement.
- When installing ladder points label, center label above ladder mount adapter on frame.

2. Apply bead of adhesive to back of new ladder points label (Figure 1, Item 5) and apply ladder points label to frame.

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
FIXED LADDER REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool kit, general mechanic's (WP 0217, Table 1, Item 13)

Materials/Parts
Nut, self-locking, hexagon (LOCKNUTS) Qty: 4 (WP 0203, Figure 57, Item 4)
Fixed ladder assembly (WP 0203, Figure 57, Item 5)

Personnel Required
91J Quartermaster and Chemical Equipment Repairer

Equipment Condition
MFS TRM grounded (TM 10-4930-371-10)

Time to Complete
0.5 Hour(s)

REMOVAL

NOTE

Note orientation of hardware and components to aid in installation.

1. Remove four bolts, (Figure 1, Item 1), eight flat washers (Figure 1, Items 2 and 3), and four locknuts (Figure 1, Item 4). Discard locknuts.
2. Remove fixed ladder (Figure 1, Item 5) from MFS TRM.

REMOVAL - Continued

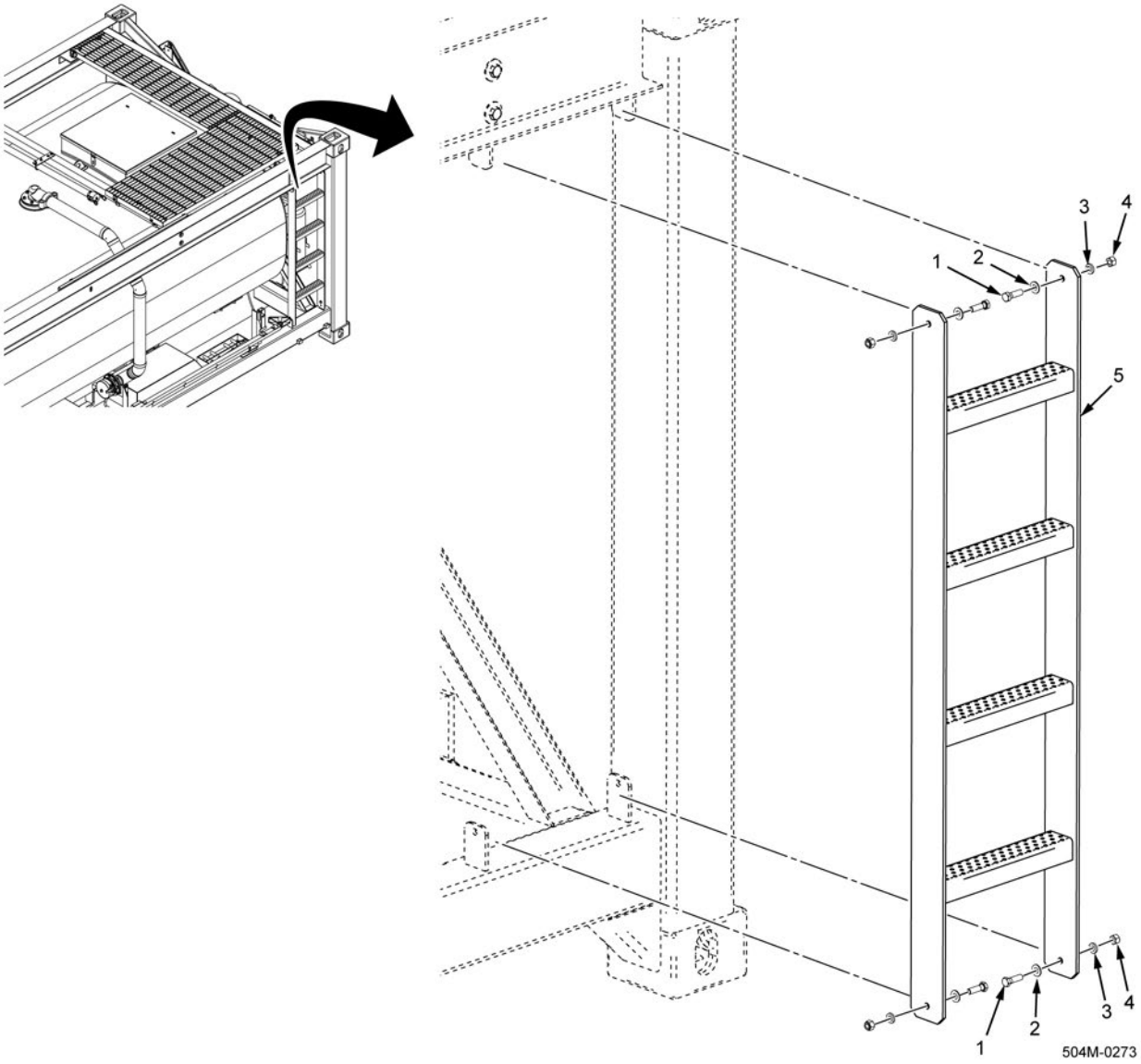


Figure 1. Fixed Ladder.

END OF TASK

INSTALLATION

Install fixed ladder (Figure 1, Item 5) on MFS TRM and secure with four bolts (Figure 1, Item 1), eight flat washers (Figure 1, Items 2 and 3), and four new locknuts (Figure 1, Item 4).

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
HOSE TUBE CABINET ASSEMBLY REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool kit, general mechanic's (WP 0217, Table 1, Item 13)

Materials/Parts
Sealant, Silicone, RTV (WP 0216, Table 1, Item 12)
Nut, self-locking, hexagon (LOCKNUTS) Qty: 6 (WP 0204, Figure 58, Item 8)
Hose Tube Cabinet Assembly (WP 0204, Figure 58, Item 1)

Personnel Required
91J Quartermaster and Chemical Equipment Repairer (2)

Equipment Condition
MFS TRM grounded (TM 10-4930-371-10)
MFS TRM shut down (TM 10-4930-371-10)
MFS TRM on ground (TM 10-4930-371-10)

Time to Complete
1 Hour(s)

REMOVAL

1. Remove all items from hose tube cabinet assembly (Figure 1, Item 5).
2. Remove two bolts (Figure 1, Item 1), four flat washers (Figure 1, Item 2), and two locknuts (Figure 1, Item 3) from angle bracket (Figure 1, Item 4) beneath hose tube cabinet assembly (Figure 1, Item 5). Discard locknuts.
3. Remove four bolts (Figure 1, Item 6), flat washers (Figure 1, Item 7), flat washers (Figure 1, Item 2), and locknuts (Figure 1, Item 3). Discard locknuts.
4. Remove hose tube cabinet assembly (Figure 1, Item 5) from MFS TRM (Figure 1, Item 8).

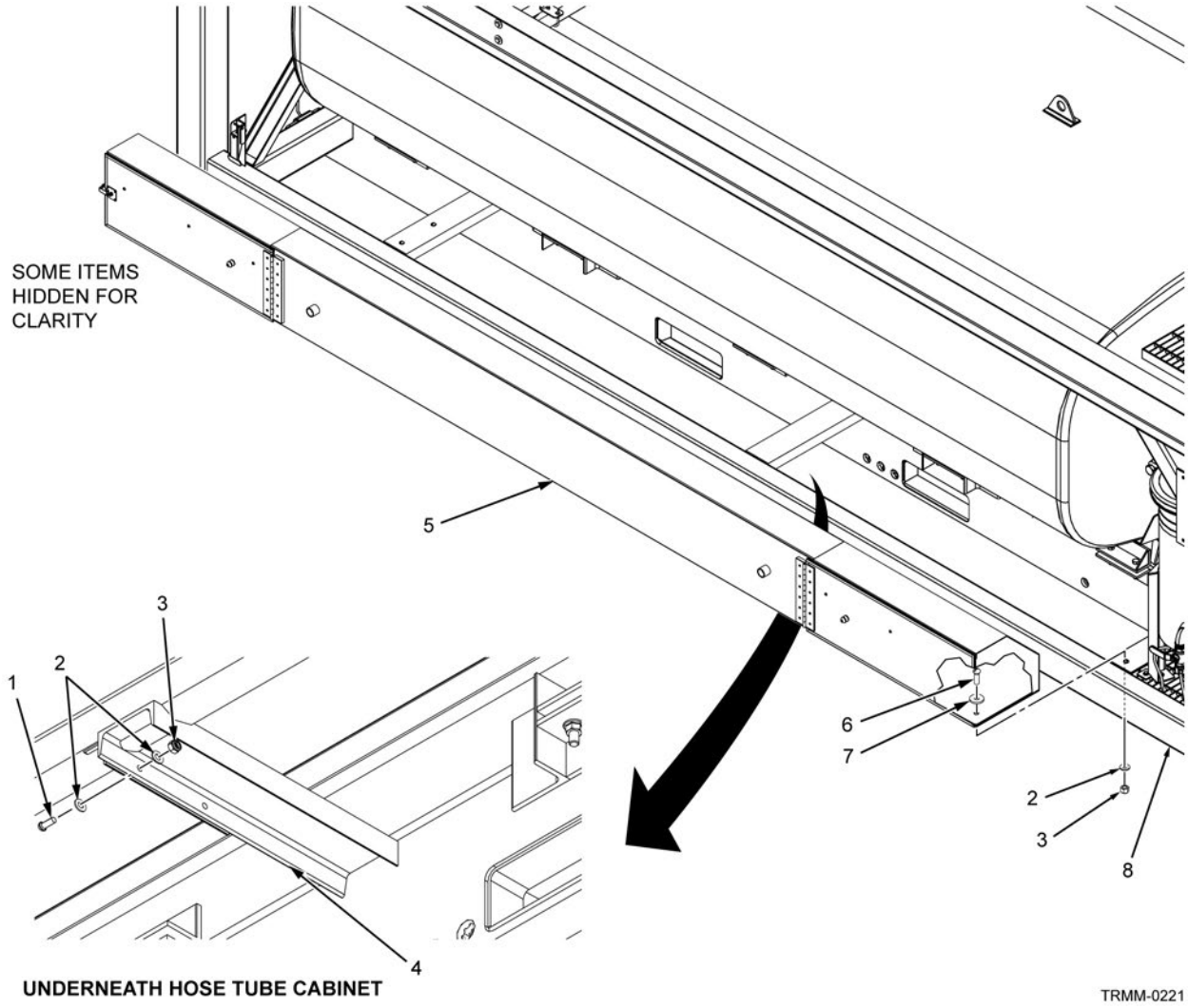


Figure 1. Hose Tube Cabinet.

END OF TASK

INSTALLATION

1. Install hose tube cabinet assembly (Figure 1, Item 5) in MFS TRM (Figure 1, Item 8).

INSTALLATION - Continued

2. Install two bolts (Figure 1, Item 1) four flat washers (Figure 1, Item 2), and two new locknuts (Figure 1, Item 3) through angle bracket. (Figure 1, Item 4) to secure cabinet to MRS TRM.

WARNING

RTV sealant may cause irritation or discomfort to the eyes, skin, nose and throat and should not be ingested. Safety glasses, goggles, rubber gloves and aprons should be worn when handling. Clean-up materials and applicators should be recycled or disposed of IAW local protocol. Failure to comply may cause injury to personnel and damage to the environment.

3. Apply thin bead of RTV sealant around perimeter of four flat washers (Figure 1, Item 7).
4. Secure hose tube cabinet assembly ends in place with four bolts (Figure 1, Item 6), four flat washers (Figure 1, Item 7), four flat washers (Figure 1, Item 2) and four new locknuts (Figure 1, Item 3).
5. Stow all previously removed items in hose tube cabinet.

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
HOSE TUBE CABINET ASSEMBLY REPAIR

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Drill (WP 0217, Table 1, Item 3)
- Drill bits (WP 0217, Table 1, Item 4)
- Gloves, disposable nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)
- Respirator (WP 0216, Table 1, Item 11)
- Rivet gun (WP 0217, Table 1, Item 10)

Materials/Parts
- Adhesive (WP 0216, Table 1, Item 2)
- Cloth, cleaning (WP 0216, Table 1, Item 4)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer (2)

References
- ATP 4-43

Equipment Condition
- MFS TRM grounded (TM 10-4930-371-10)
- MFS TRM shut down (TM 10-4930-371-10)

Time to Complete
- 1.5 Hour(s)

HOSE TUBE CABINET LATCHES DISASSEMBLY

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Use a drip pan to collect leaking fuel. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.

NOTE

Disassembly is the same for right and left doors.

1. Open hose tube cabinet door (Figure 1, Item 8).
2. Remove two screws (Figure 1, Item 6) and locknuts (Figure 1, Item 3). Discard locknuts.
3. Remove door latch keeper (Figure 1, Item 5) and door latch keeper spacer (Figure 1, Item 4).
4. Remove screw (Figure 1, Item 1) and locknut (Figure 1, Item 2). Discard locknut.
5. Remove bind post (Figure 1, Item 10) from barrel (Figure 1, Item 7), and remove latch (Figure 1, Item 9) from door.

HOSE TUBE CABINET LATCHES DISASSEMBLY - Continued

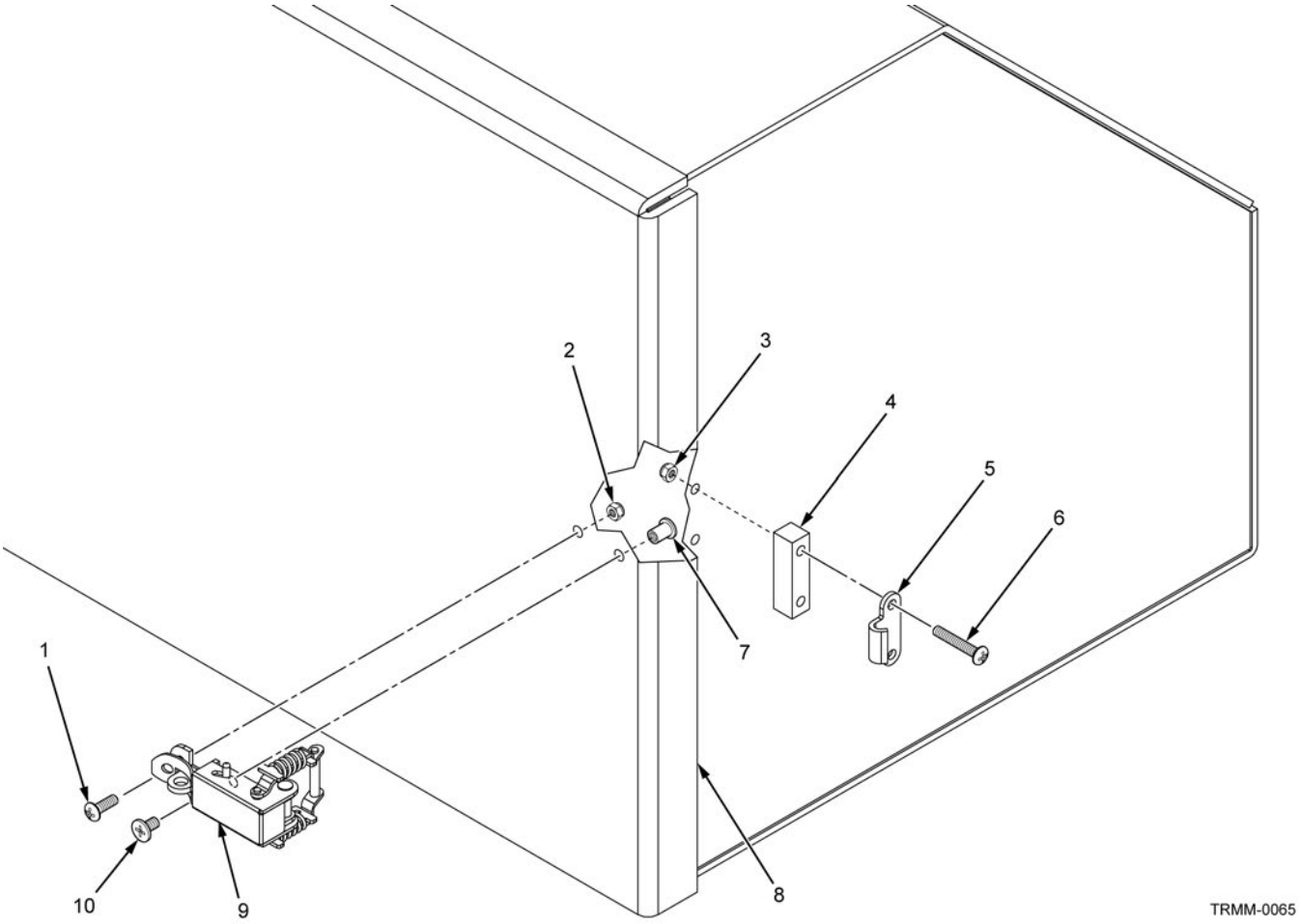


Figure 1. Hose Tube Cabinet Latches.

END OF TASK

HOSE TUBE CABINET LATCHES ASSEMBLY

NOTE

Assembly is the same for right and left doors.

1. Install two screws (Figure 1, Item 6), door latch keeper (Figure 1, Item 5), door latch spacer (Figure 1, Item 4) and two new locknuts (Figure 1, Item 3).
2. Install latch (Figure 1, Item 9) using screw (Figure 1, Item 1) and new locknut (Figure 1, Item 2).
3. Install bind post (Figure 1, Item 10) through latch (Figure 1, Item 9) and secure with barrel (Figure 1, Item 7).

END OF TASK

HOSE TUBE CABINET DOOR AND HINGE DISASSEMBLY

NOTE

Disassembly is the same for right and left doors.

1. Open hose tube cabinet door (Figure 2, Item 3).
2. Remove six bolts (Figure 2, Item 5) and locknuts (Figure 2, Item 2). Discard locknuts.
3. Remove door (Figure 2, Item 3) from hose tube cabinet (Figure 2, Item 1).
4. Remove six bolts (Figure 2, Item 4) and locknuts (Figure 2, Item 7). Discard locknuts.
5. Remove hinge (Figure 2, Item 6) and hinge spacer (Figure 2, Item 8).

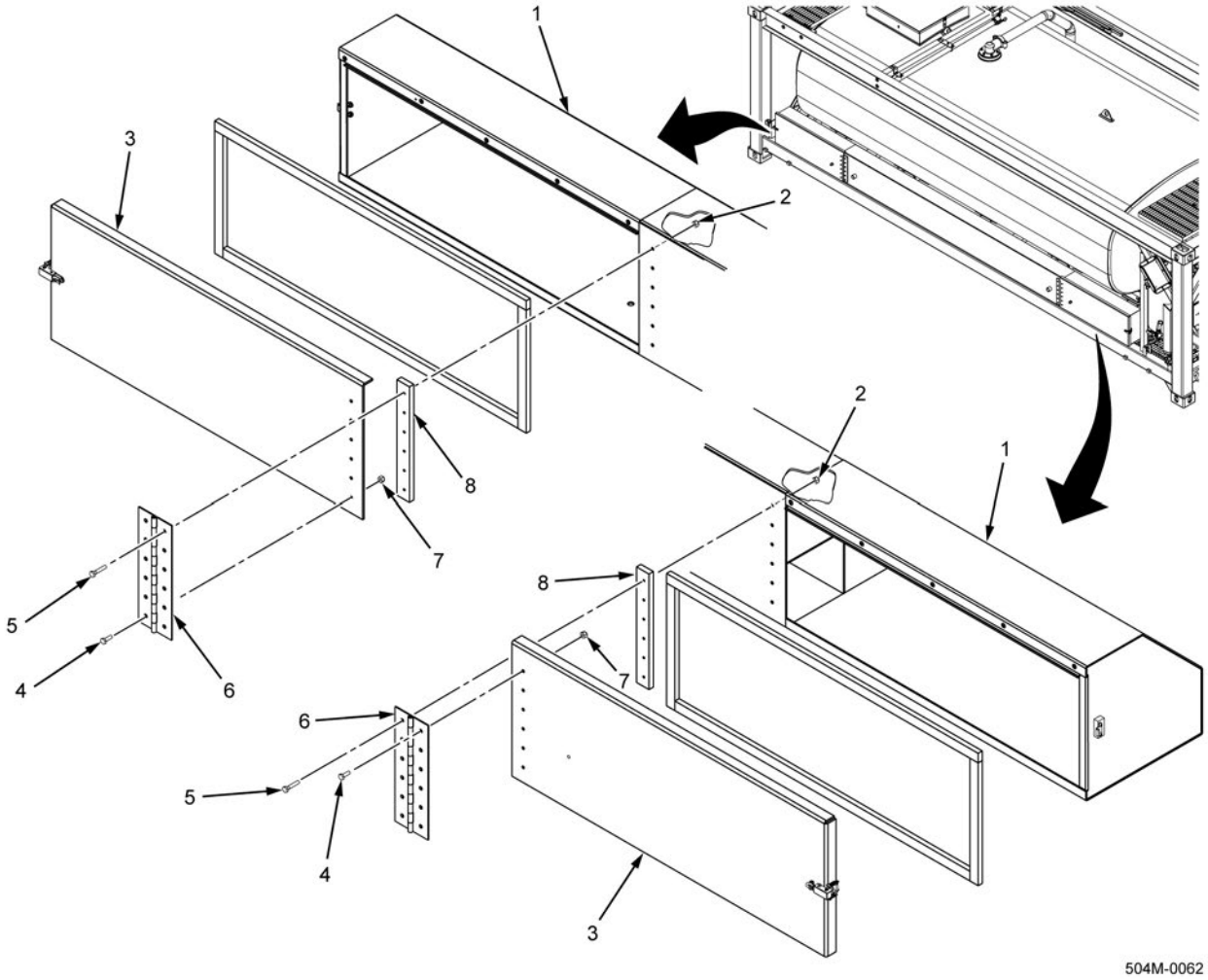


Figure 2. Removing Hose Tube Cabinet Door and Hinge.

END OF TASK

HOSE TUBE CABINET DOOR AND HINGE ASSEMBLY

NOTE

Assembly is the same for right and left doors.

1. Install hinge (Figure 2, Item 6) and hinge spacer (Figure 2, Item 8) using six bolts (Figure 2, Item 5) and new locknuts (Figure 2, Item 2) to hose tube cabinet (Figure 2, Item 1).
2. Install door (Figure 2, Item 3) on hinge (Figure 2, Item 6) using six bolts (Figure 2, Item 4) and new locknuts (Figure 2, Item 7).

END OF TASK

HOSE TUBE CABINET DOOR HOLDBACK DISASSEMBLY

NOTE

Disassembly is the same for right and left doors.

1. Open hose tube cabinet door (Figure 3, Item 1).
2. Remove screw (Figure 3, Item 5) and locknut (Figure 3, Item 2). Discard locknut.
3. Remove door holdback (Figure 3, Item 6).
4. Remove screw (Figure 3, Item 4) and locknut (Figure 3, Item 2). Discard locknut.
5. Remove door stem (Figure 3, Item 3).

HOSE TUBE CABINET DOOR HOLDBACK DISASSEMBLY - Continued

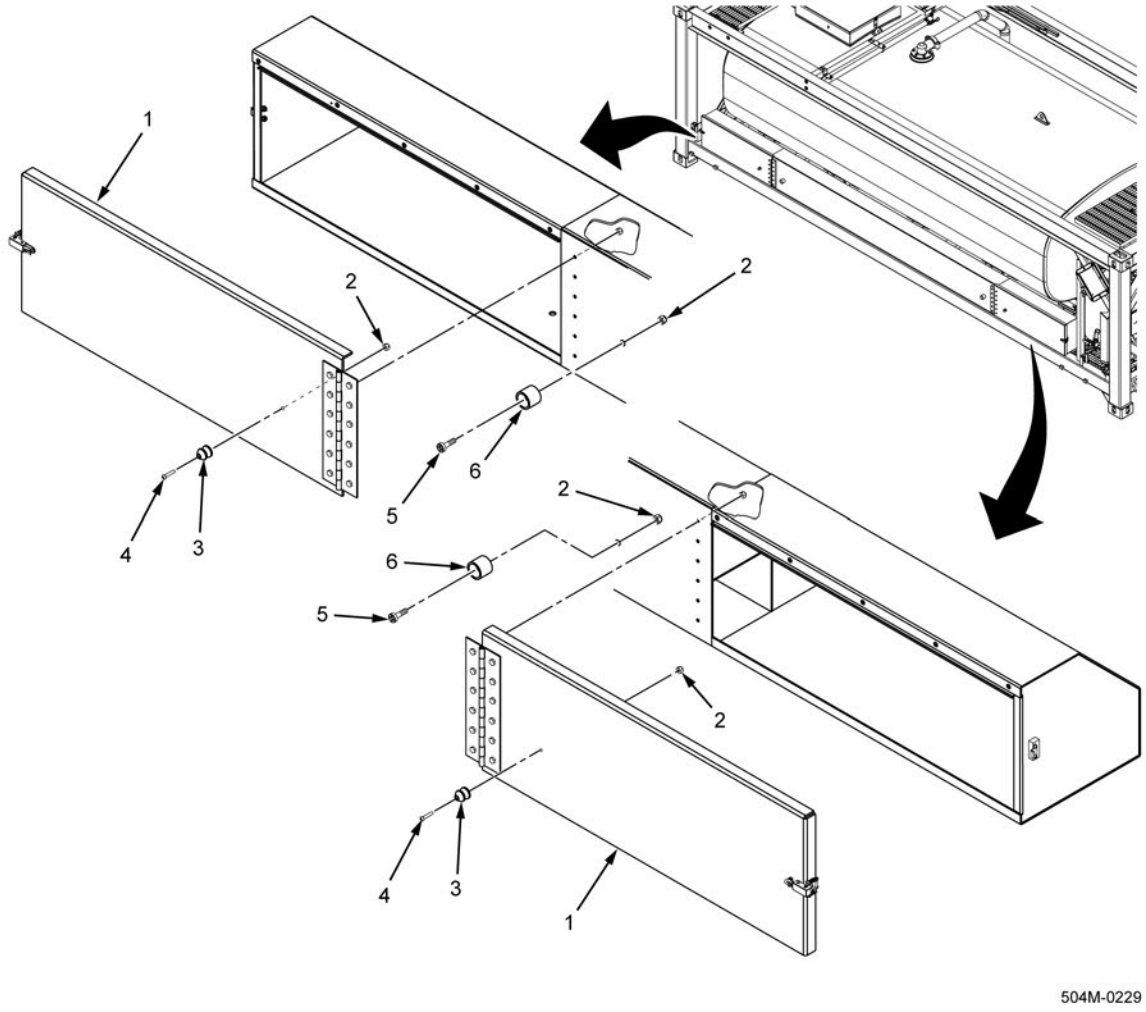


Figure 3. Hose Tube Cabinet Door Stop.

END OF TASK

HOSE TUBE CABINET DOOR HOLDBACK ASSEMBLY

NOTE

Assembly is the same for right and left doors.

1. Install door holdback (Figure 3, Item 6) using screw (Figure 3, Item 5) and new locknut (Figure 3, Item 2).
2. Install door stem (Figure 3, Item 3) using screw (Figure 3, Item 4) and new locknut (Figure 3, Item 2).
3. Close hose tube cabinet door (Figure 3, Item 1).

END OF TASK

HOSE TUBE CABINET DOOR GASKET DISASSEMBLY

NOTE

- Disassembly is the same for right and left doors.
- Note orientation of gasket pieces to aid in assembly.

1. Open hose tube cabinet door.
2. Remove gasket (Figure 4, Item 1) material from hose tube cabinet door (Figure 4, Item 2).
3. Remove remaining residual gasket material.

HOSE TUBE CABINET DOOR GASKET DISASSEMBLY - Continued

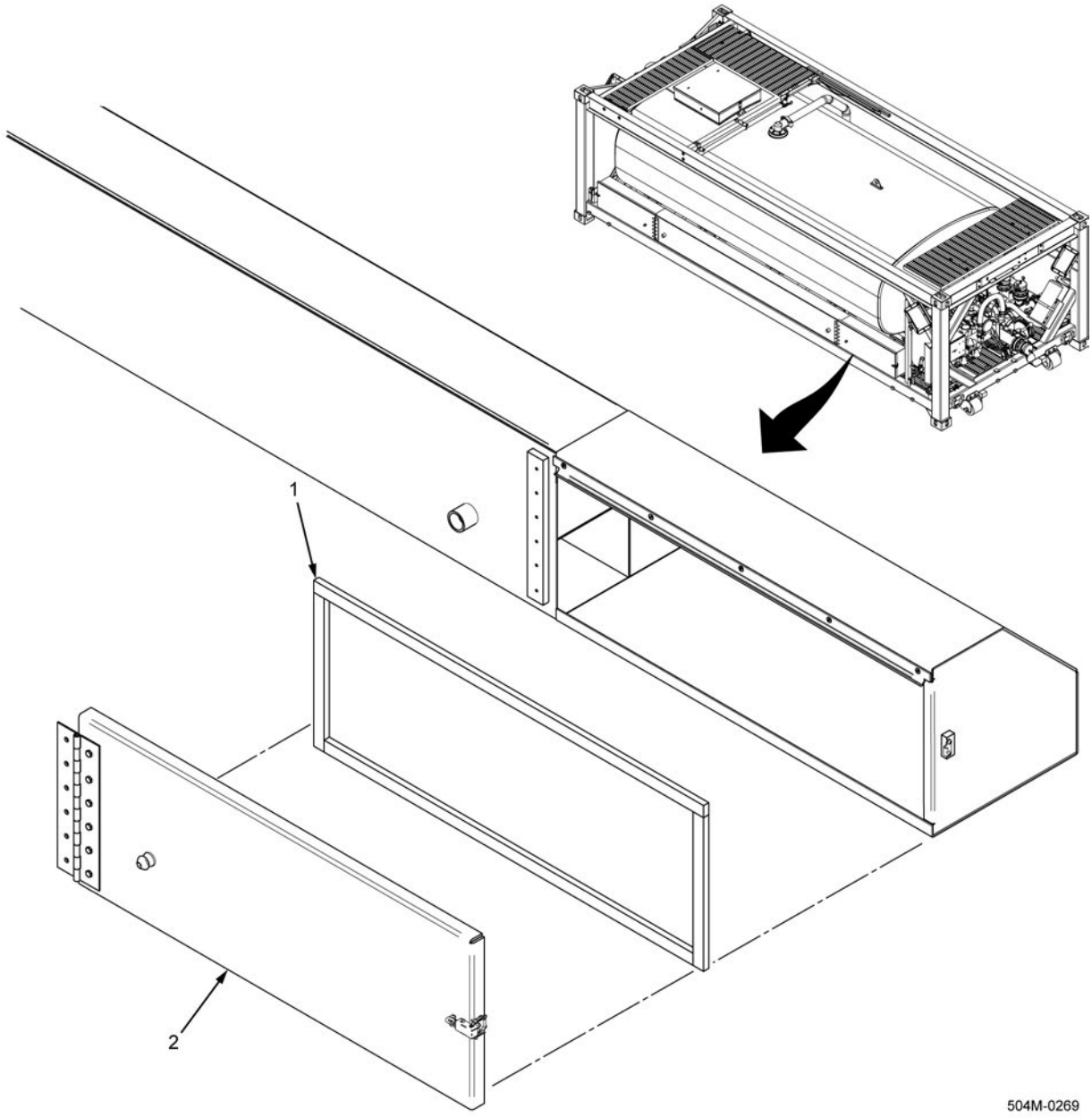


Figure 4. Hose Tube Cabinet Door Gasket.

END OF TASK

HOSE TUBE CABINET DOOR GASKET ASSEMBLY

WARNING

- Ensure work is completed in a well-ventilated, non-enclosed space.
- Do not sand, grind, or heat surface of MFS TRM. Failure to comply could result in injury or death to personnel.

NOTE

Assembly is the same for right and left doors.

1. Apply adhesive to back surface of gasket (Figure 4, Item 1).
2. Install gasket (Figure 4, Item 1) on hose tube cabinet door (Figure 4, Item 2).
3. Allow adhesive to dry completely.
4. Close hose tube cabinet door.

END OF TASK

HOSE TUBE CABINET DOOR GUTTER DISASSEMBLY

NOTE

Disassembly is the same for right and left doors.

1. To remove hose tube cabinet gutter (Figure 5, Item 2):
   a. Open hose tube cabinet door.
   b. Remove gutter (Figure 5, Item 2) from hose tube cabinet (Figure 5, Item 1).
2. To remove damaged rivet (Figure 5, Item 3):
   a. Open hose tube cabinet door.
   b. Remove damaged rivet (Figure 5, Item 3) from hose tube cabinet door gutter (Figure 5, Item 2).

HOSE TUBE CABINET DOOR GUTTER DISASSEMBLY - Continued

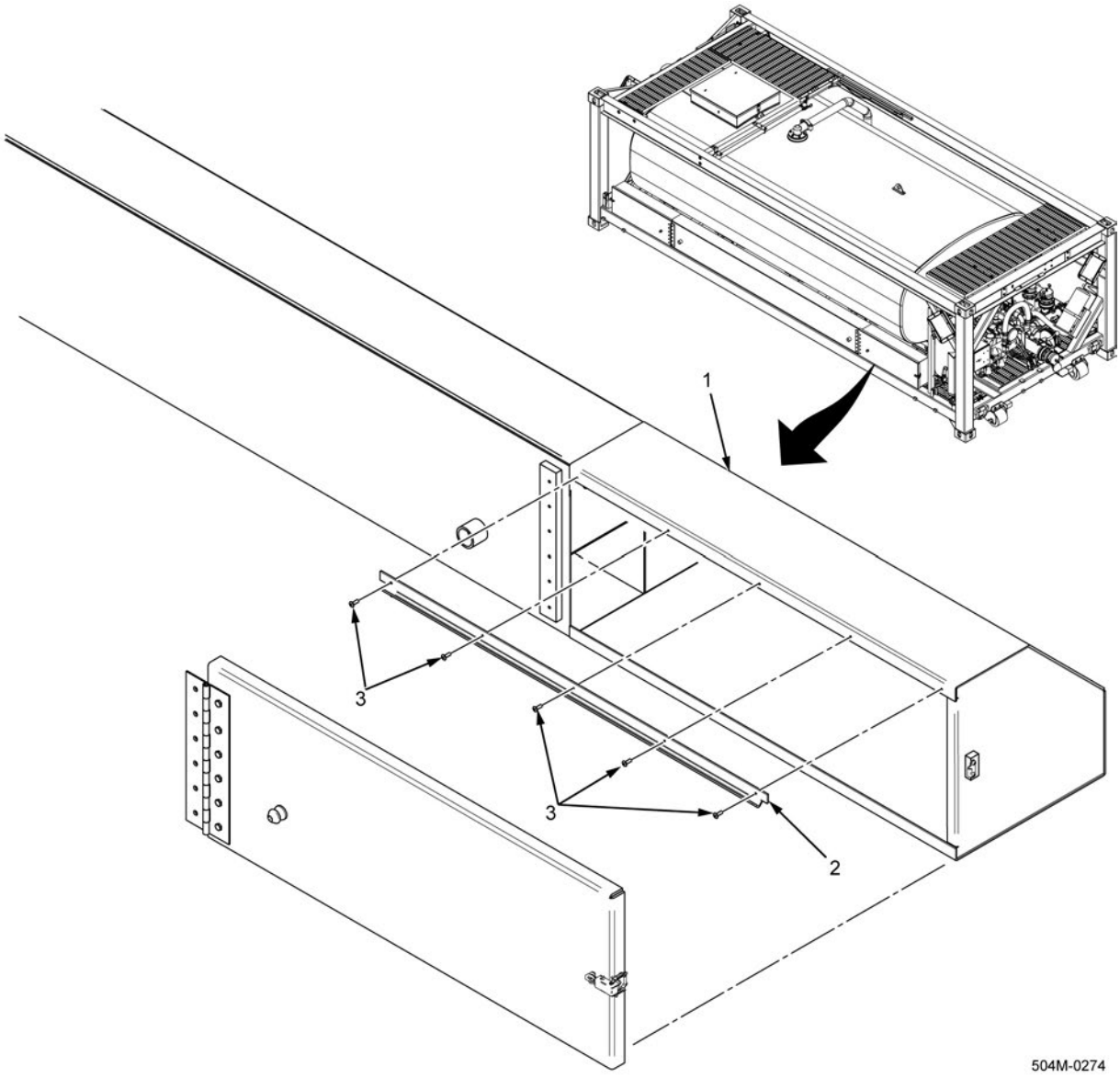


Figure 5. Hose Tube Cabinet Door Gutter.

END OF TASK

HOSE TUBE CABINET DOOR GUTTER ASSEMBLY

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Use a drip pan to collect leaking fuel. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.

NOTE

Assembly is the same for right and left doors.

1. To install new hose tube cabinet gutter (Figure 5, Item 2):
   a. Align new gutter (Figure 5, Item 2) with existing holes on hose tube cabinet (Figure 5, Item 1) and mark location of holes on gutter.
   b. Drill holes in gutter (Figure 5, Item 2) at marked locations.
   c. Attach gutter (Figure 5, Item 2) to hose tube cabinet (Figure 5, Item 1) with five new rivets (Figure 5, Item 3).
   d. Close hose tube cabinet door.
2. To replace damaged rivet (Figure 5, Item 3):
   a. Install new rivet (Figure 5, Item 3) in hose tube cabinet gutter (Figure 5, Item 2).
   b. Close hose tube cabinet door.

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
FILTER/SEPARATOR ASSEMBLY REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposable nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)
- Pan, drip (WP 0217, Table 1, Item 8)

Materials/Parts
- Absorbent material (WP 0216, Table 1, Item 1)
- Cloth, cleaning (WP 0216, Table 1, Item 4)
- Nut, self-locking, hexagon (LOCKNUTS) (WP 0205, Figure 59, Item 24)
- Nut, self-locking, hexagon (LOCKNUTS) (WP 0205, Figure 59, Item 29)
- Washer, lock, internal tooth Qty: 2 (WP 0205, Figure 59, Item 35)
- Filter/Separator Assembly (WP 0205, Figure 59, Item 1)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer (2)

References
- ATP 4-43
- TM 10-4930-371-10
- WP 0134

Equipment Condition
- MFS TRM on ground (TM 10-4930-371-10)
- MFS TRM grounded (TM 10-4930-371-10)
- Filter/Separator drained (TM 10-4930-371-10)

Time to Complete
- 6 Hour(s)

REMOVAL

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Filter/Separator weighs in excess of 80 pounds. Lifting filter/separator improperly can injure personnel. Use two personnel to lift filter/separator out of MFS TRM.
- Failure to comply could result in injury or death to personnel.

1. Remove vapor recovery line dust cap (Figure 1, Item 2).

REMOVAL - Continued

2. Momentarily open then close bottom loading valve V1 (Figure 1, Item 1) to vent tank pressure.

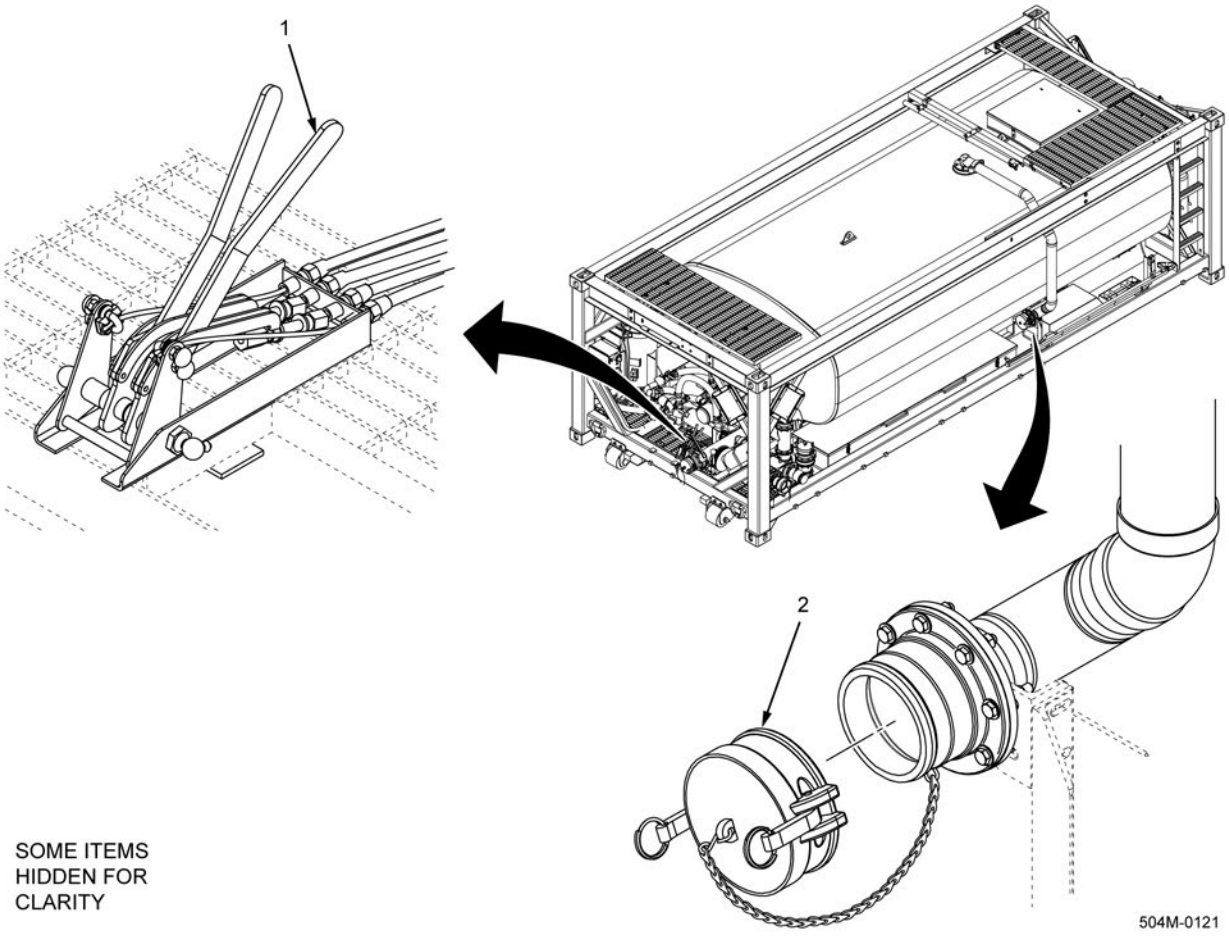


Figure 1. Fuel System Venting.

3. Place drip pan under filter/separator assembly (Figure 2, Item 13) to catch residual fuel.
4. Ensure all piping valves are closed.

NOTE

Note orientation of hardware and components to aid in installation.

5. Remove snap grip clip (Figure 2, Item 3).
6. Remove hose clamp (Figure 2, Item 1) and flexible hose (Figure 2, Item 2).
7. Disconnect tube nut (Figure 2, Item 5) and product line (Figure 2, Item 4).
8. Remove hose clamp (Figure 2, Item 13) and flexible hose (Figure 2, Item 12).
9. Disconnect four tube nuts (Figure 2, Items 10, 16, 18, and 20) and product lines (Figure 2, Items 11, 15, 17, and 19) from differential pressure gauge (Figure 2, Item 6).
10. Remove bolt (Figure 2, Item 14), two flat washers (Figure 2, Item 8), grating clasp (Figure 2, Item 7), and locknut (Figure 2, Item 9). Discard locknut.

REMOVAL - Continued

11. Remove differential pressure gauge (Figure 2, Item 6).

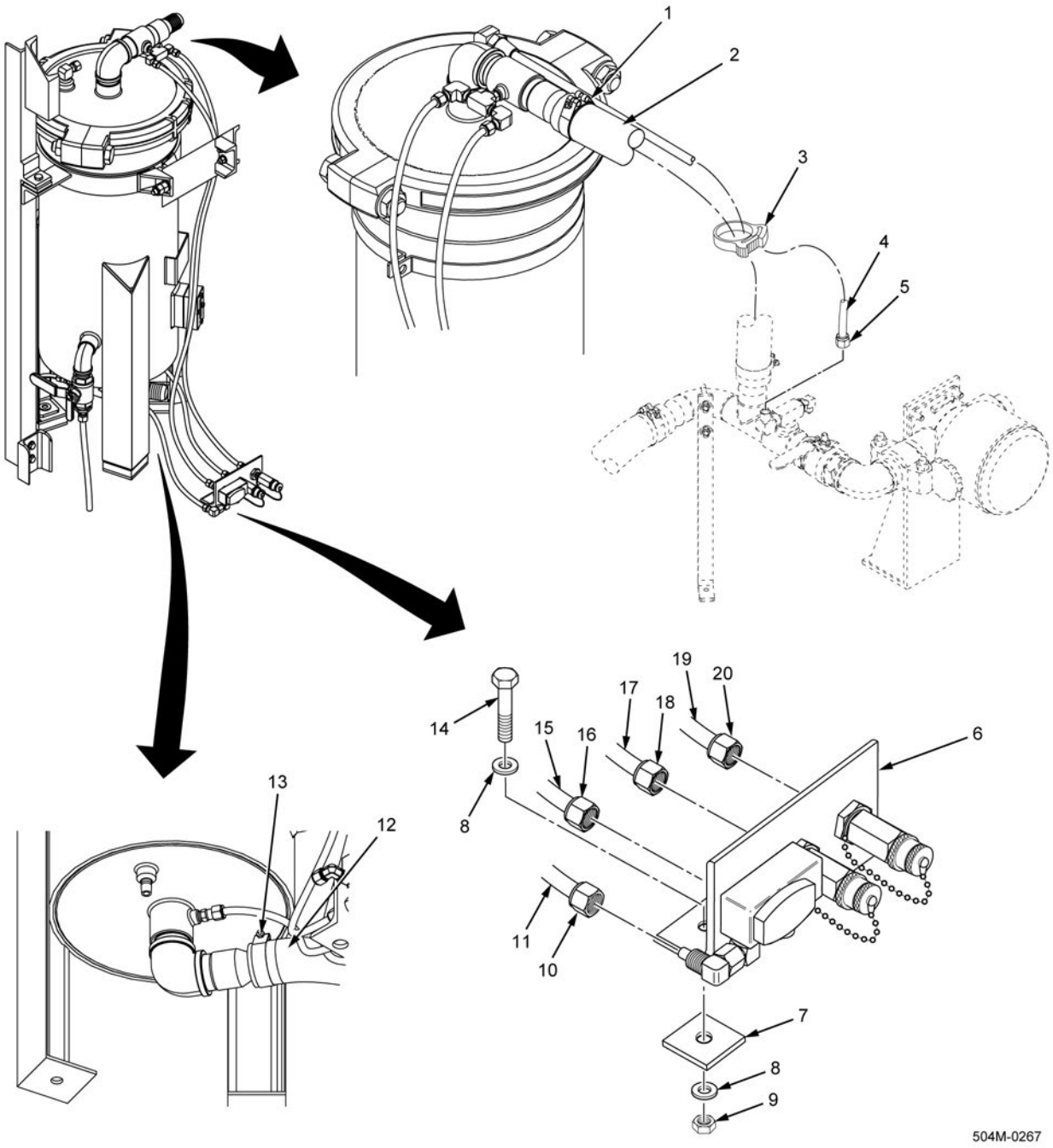


Figure 2. Disconnecting Filter/Separator Connections.

REMOVAL - Continued

12. Remove two nuts (Figure 3, Items 17 and 18), flat washers (Figure 3, Item 16), rubber pad (Figure 3, Item 23) and bolt (Figure 3, Item 25) securing ring clamp (Figure 3, Item 9) to side brace (Figure 3, Item 4).

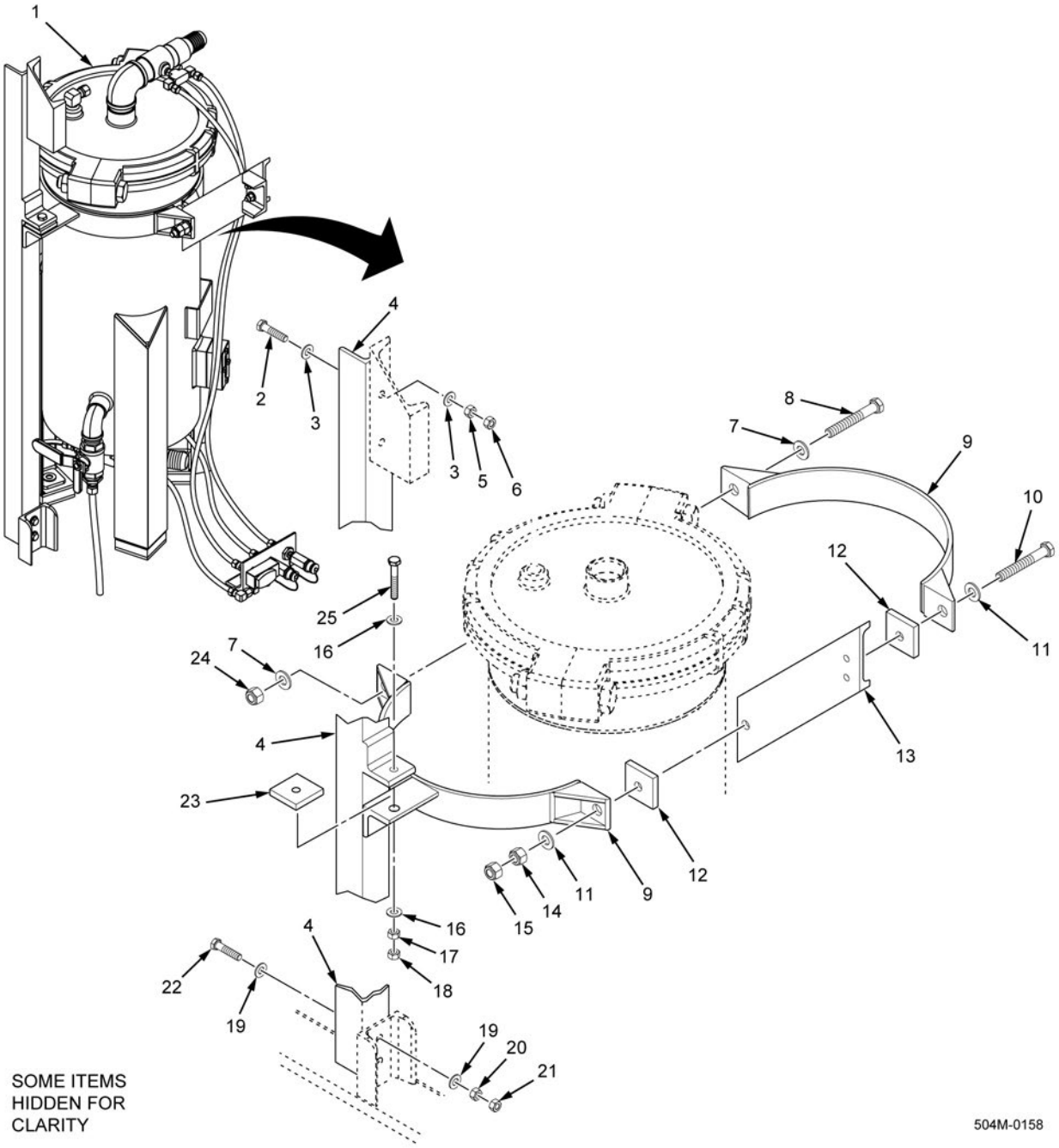


Figure 3. Detaching Ring Clamp and Removing Side Brace.

13. Remove two bolts (Figure 3, Item 22), four flat washers (Figure 3, Items 19), and nuts (Figure 3, Items 20 and 21) securing bottom of side brace (Figure 3, Item 4) to MFS TRM frame.

REMOVAL - Continued

14. Remove two bolts (Figure 3, Item 2), four flat washers (Figure 3, Item 3), and nuts (Figure 3, Items 5 and 6) securing top of side brace (Figure 3, Item 4) to MFS TRM frame. Remove side brace (Figure 3, Item 4) and set aside.
15. Remove one bolt (Figure 3, Item 10), two flat washers (Figure 3, Items 11), nuts (Figure 3, Items 14 and 15), and rubber pads (Figure 3, Item 12) securing ring clamp (Figure 3, Item 9) to angle brace (Figure 3, Item 13).
16. Remove one bolt (Figure 3, Item 8), two flat washers (Figure 3, Item 7), and one locknut (Figure 3, Item 24). Discard locknut. Retain ring clamp (Figure 3, Item 9) for use with replacement filter/separator assembly (Figure 3, Item 1).
17. Remove four nuts (Figure 4, Items 7 and 8), flat washers (Figure 4, Item 9), two square washers (Figure 4, Item 10) and bolts (Figure 4, Item 1).
18. Remove two nuts (Figure 4, Items 3 and 4), internal lock washers (Figure 4, Item 6), square washer (Figure 4, Item 10) and bolt (Figure 4, Item 2), to release ground strap (Figure 4, Item 5). Discard internal lock washers.

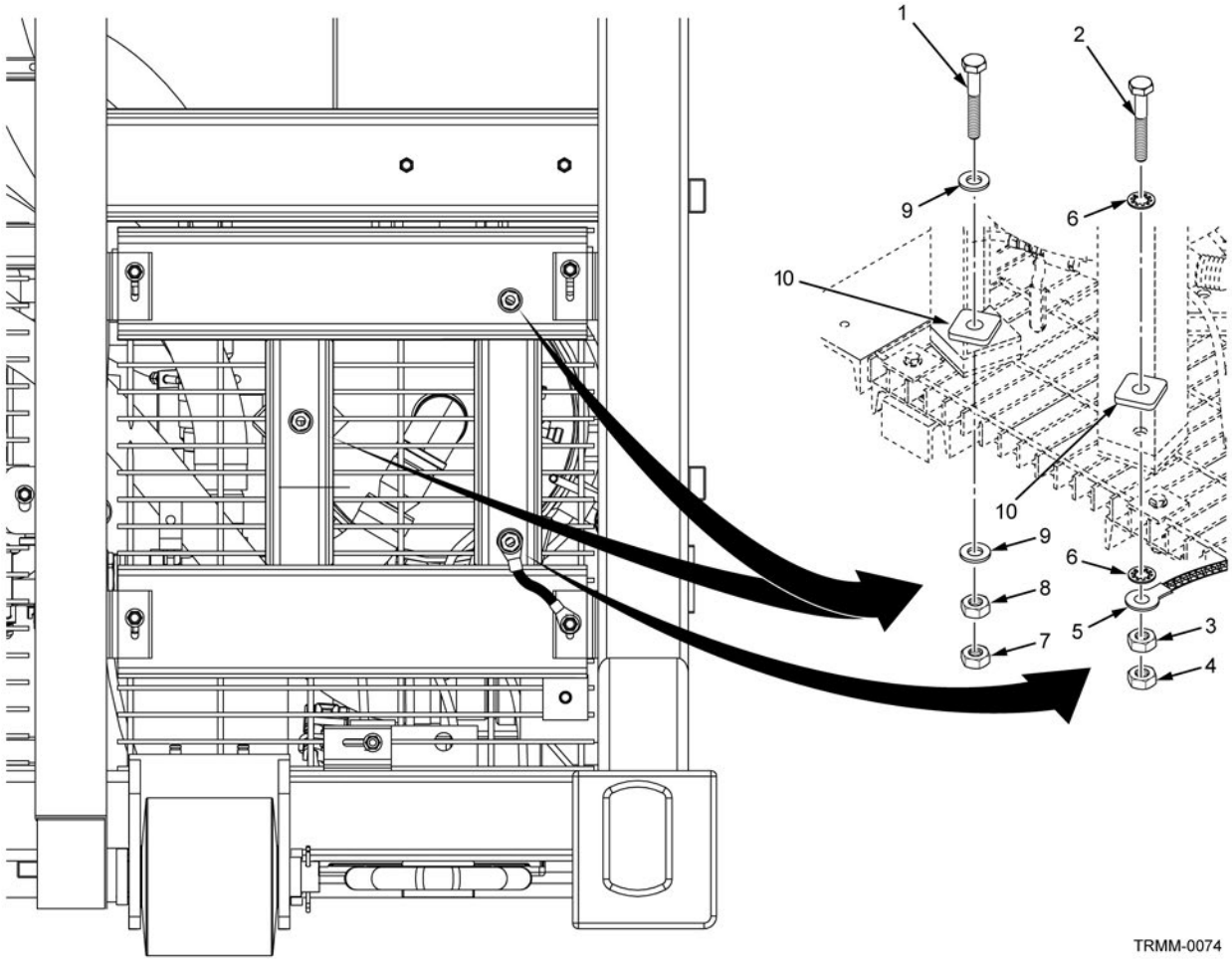


Figure 4. Removing Filter/Separator Hardware.

19. Remove filter/separator assembly (Figure 5, Item 1) from MFS TRM.

REMOVAL - Continued

20. Remove three rubber pads (Figure 5, Item 2) and sandwich plates (Figure 5, Item 3).

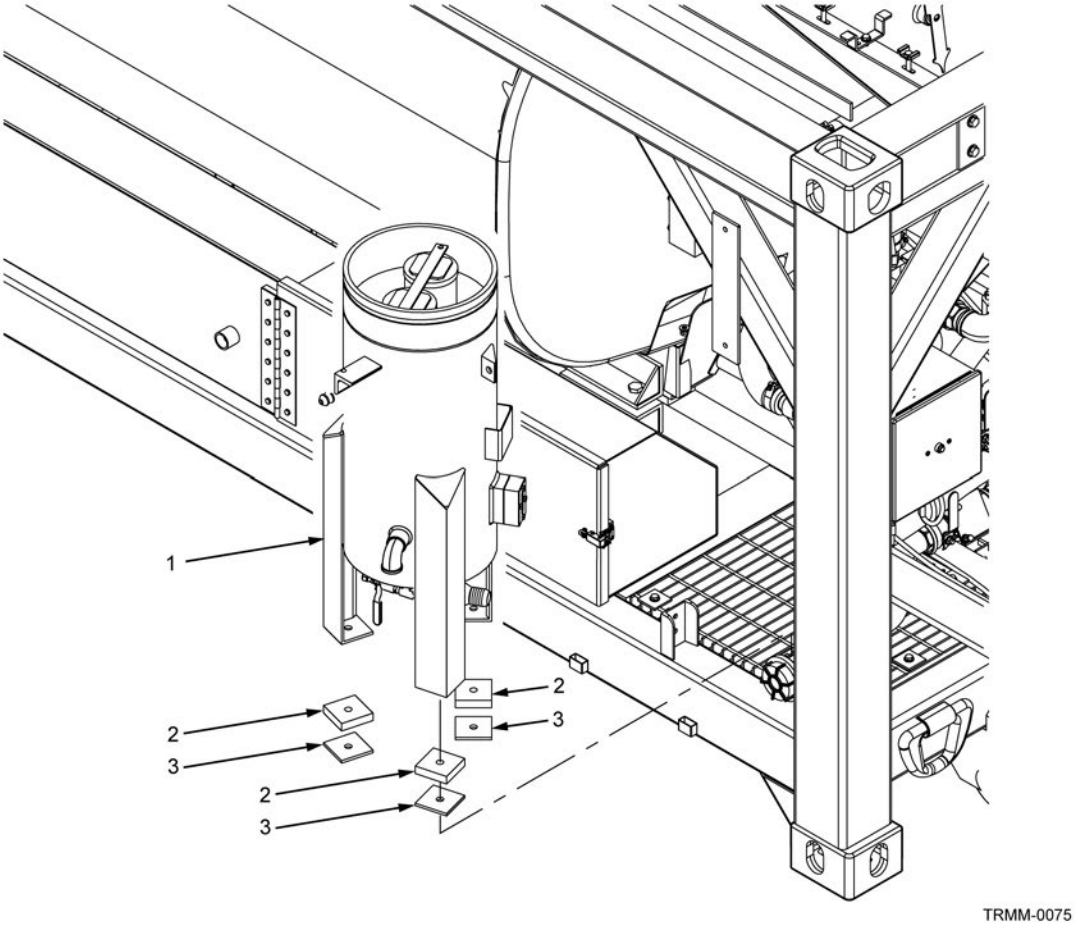


Figure 5. Removing Filter/Separator Assembly.

END OF TASK

INSTALLATION

1. Position three sandwich plates (Figure 5, Item 3) and rubber pads (Figure 5, Item 2) on MFS TRM, aligning holes with mounting holes in h-bracket (Figure 6, Item 11).

NOTE

Ensure filter/separator assembly is properly oriented in MFS TRM when installed.

2. Install filter/separator assembly (Figure 5, Item 1) in MFS TRM with legs on top of three rubber pads (Figure 5, Item 2) and sandwich plates (Figure 5, Item 3).

NOTE

Initially only three of the six nuts securing filter/separator assembly are installed. The other three nuts will be installed after all hardware is tightened.

INSTALLATION - Continued

3. Loosely install two bolts (Figure 6, Item 1), square washers (Figure 6, Item 10), four flat washers (Figure 6, Item 9), and two nuts (Figure 6, Items 7 and 8).
4. Loosely install bolt (Figure 6, Item 2), square washer (Figure 6, Item 10), two new internal lock washers (Figure 6, Item 6), ground strap (Figure 6 Item 5) and two nuts (Figure 6, Items 3 and 4).

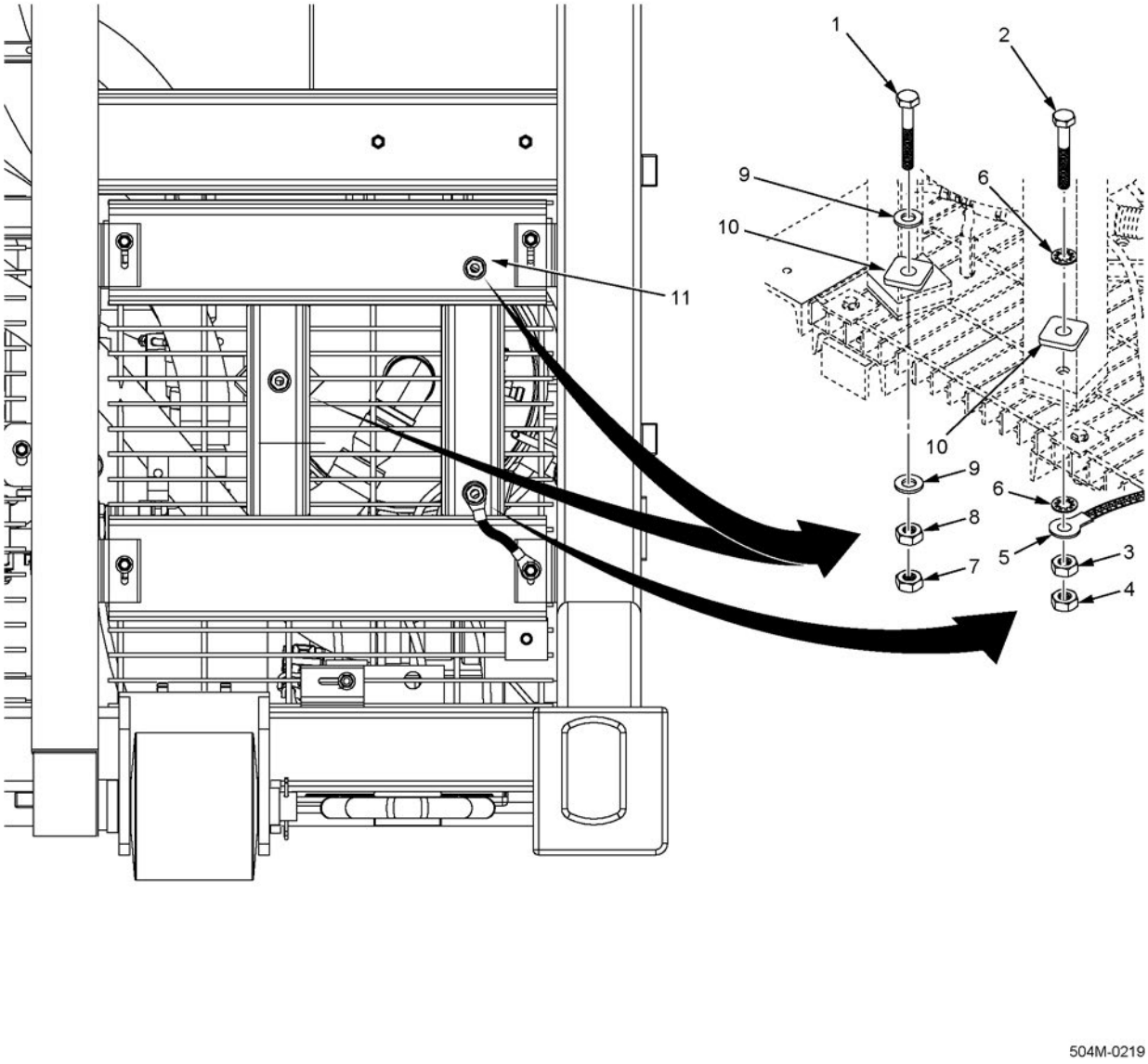


Figure 6. Installing Filter/Separator Hardware.

INSTALLATION - Continued

5. Loosely install one bolt (Figure 7, Item 10), two flat washers (Figure 7, Item 11), rubber pads (Figure 7, Item 12) and one nut (Figure 7, Item 14) through ring clamp halves (Figure 7, Item 9) and angle bracket (Figure 7, Item 13).
6. Loosely install one bolt (Figure 7, Item 8), two flat washers (Figure 7, Items 7) and one new locknut (Figure 7, Item 24), through other side of ring clamp halves (Figure 7, Item 9).

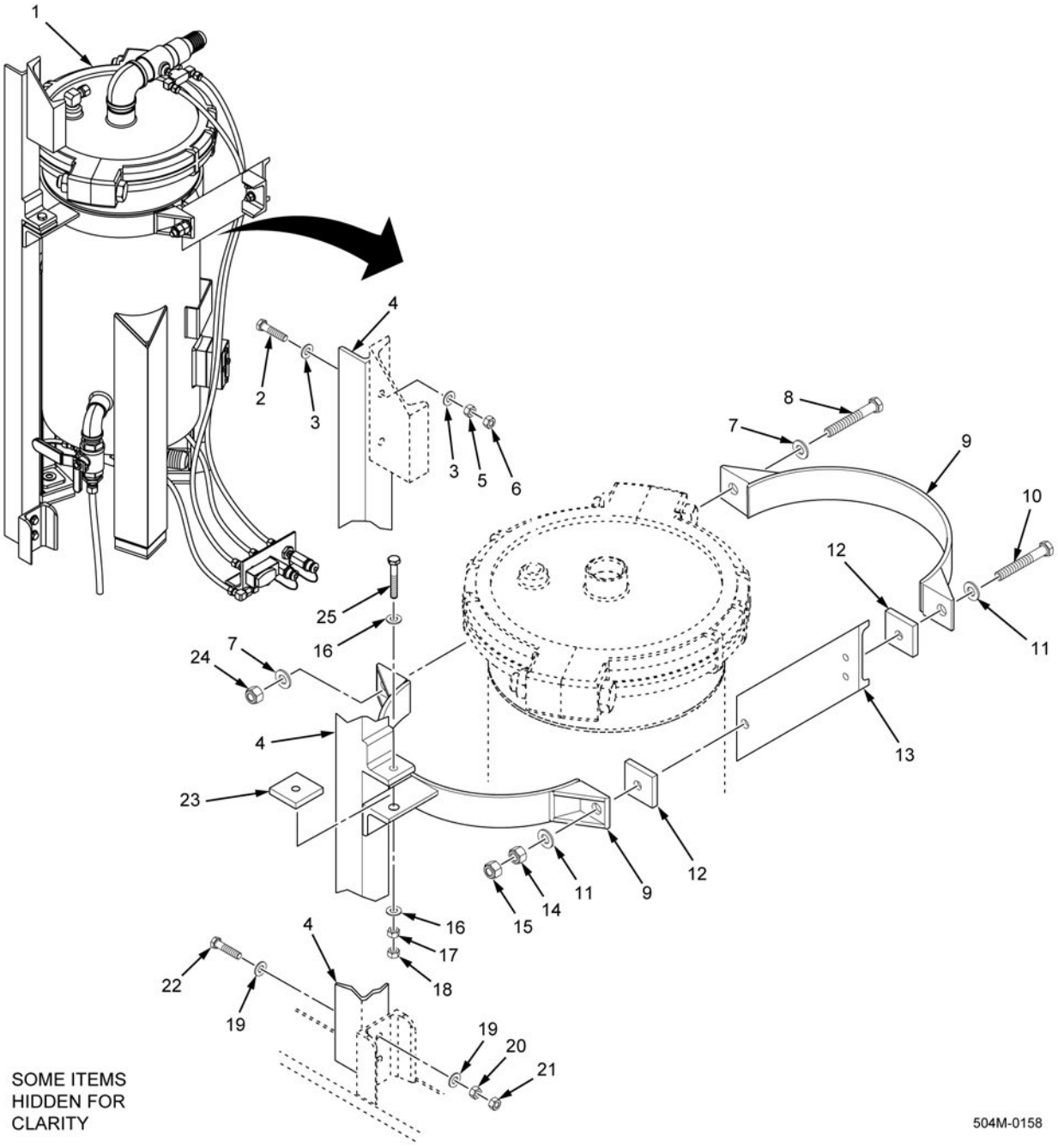


Figure 7. Securing Ring Clamp on Filter/Separator Assembly.

INSTALLATION - Continued

NOTE

Only two nuts are replaced in the following step. Jam nuts will be installed later.

7. Install side brace (Figure 7, Item 4) and loosely install top with two bolts (Figure 7, Item 2), four flat washers (Figure 7, Item 3), and two nuts (Figure 7, Item 6).

NOTE

Only two nuts are replaced in the following step. Jam nuts will be installed later.

8. Position bottom of side brace (Figure 7, Item 4) and loosely install two bolts (Figure 7, Item 22), four flat washers (Figure 7, Item 19), and two nuts (Figure 7, Item 20).

NOTE

Only one nut is replaced in the following step. A jam nut will be installed later.

9. Install bolt (Figure 7, Item 25), two flat washers (Figure 7, Item 16), rubber pad (Figure 7, Item 23), and loosely secure with nut (Figure 7, Item 17).
10. Tighten nut (Figure 7, Item 14) on ring clamp (Figure 7, Item 9).
11. Install and tighten jam nut (Figure 7, Item 15) on bolt (Figure 7, Item 10).
12. Ensure ring clamp (Figure 7, Item 9) is flush against filter/separator (Figure 7, Item 1) and tighten locknut (Figure 7, Item 24).
13. Tighten nut (Figure 7, Item 17) on side brace.
14. Install and tighten jam nut (Figure 7, Item 18) on bolt (Figure 7, Item 25) at side brace (Figure 7, Item 4).
15. Tighten two nuts (Figure 7, Item 5) on top side brace (Figure 7, Item 4).
16. Install and tighten two jam nuts (Figure 7, Item 6) on bolts (Figure 7, Item 2) at top side brace (Figure 7, Item 4).
17. Tighten two nuts (Figure 7, item 20) on bolt (Figure 3, Item 22) at bottom side brace (Figure 7, Item 4).
18. Install and tighten two jam nuts (Figure 7, Item 21) on bolts (Figure 7, Item 22) at bottom side brace (Figure 7, Item 4).
19. Tighten three nuts (Figure 6, Items 3 and 8), then install and fully tighten three jam nuts (Figure 6, Items 4 and 7).
20. Install new differential pressure gauge (Figure 8, Item 6) and secure with bolt (Figure 8, Item 14), two flat washers (Figure 8, Item 8), grating clasp (Figure 8, Item 7), and new locknut (Figure 8, Item 9).
21. Install four new product lines (Figure 8, Items 11, 15, 17, 19) with tube nuts (Figure 8, Items 10, 16, 18, 20) on differential pressure gauge (Figure 8, Item 6).
22. Install flexible hose (Figure 8, Item 12) with hose clamp (Figure 8, Item 13).
23. Install new product line (Figure 8, Item 4) with tube nut (Figure 2, Item 5).
24. Install flexible hose (Figure 2, Item 2) with hose clamp (Figure 8, Item 1).
25. Install snap grip clip (Figure 8, Item 3).

INSTALLATION - Continued

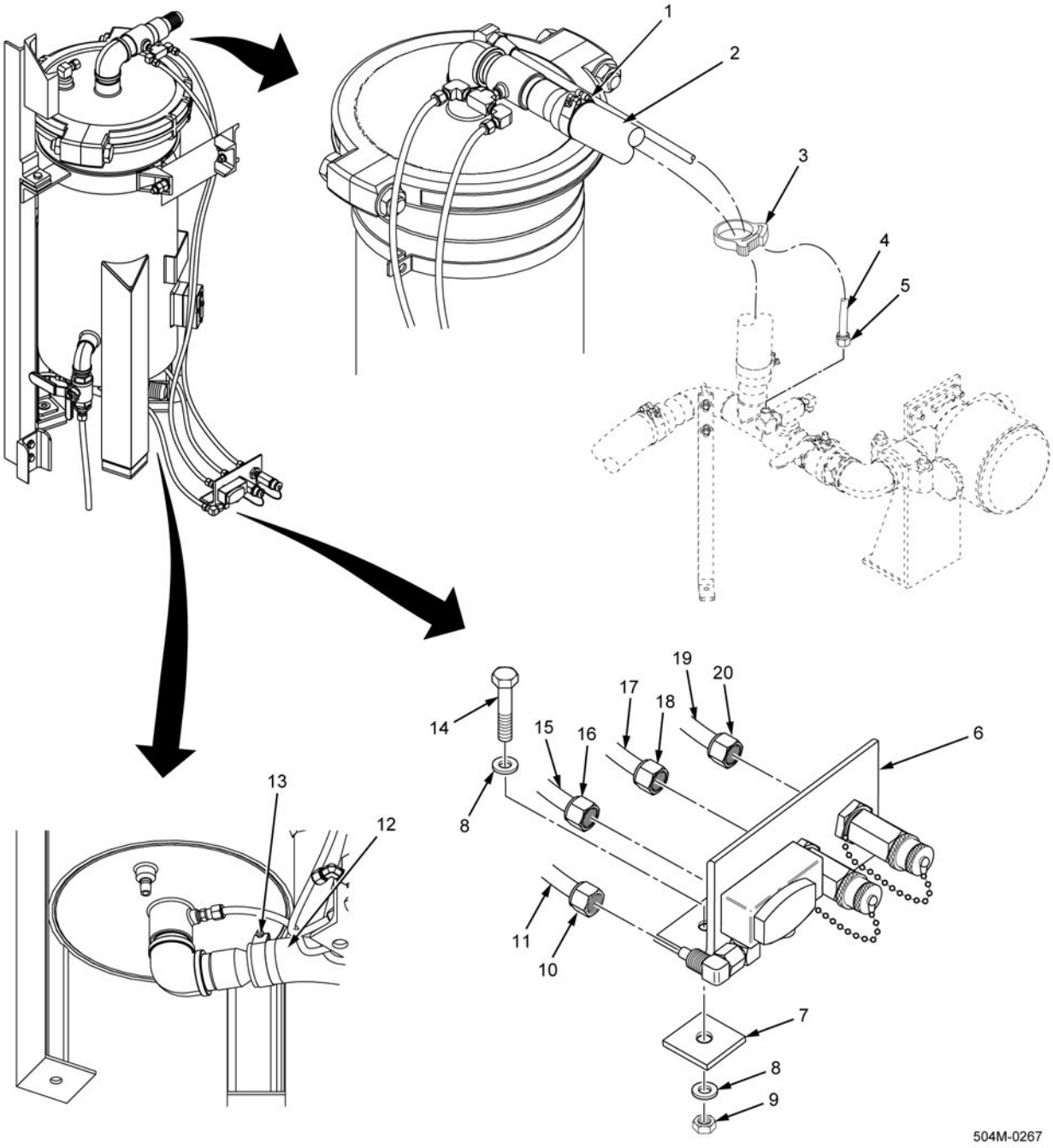


Figure 8. Connecting Filter/Separator Connections.

26. Install vapor recovery line dust cap (Figure 9, Item 1).

INSTALLATION - Continued

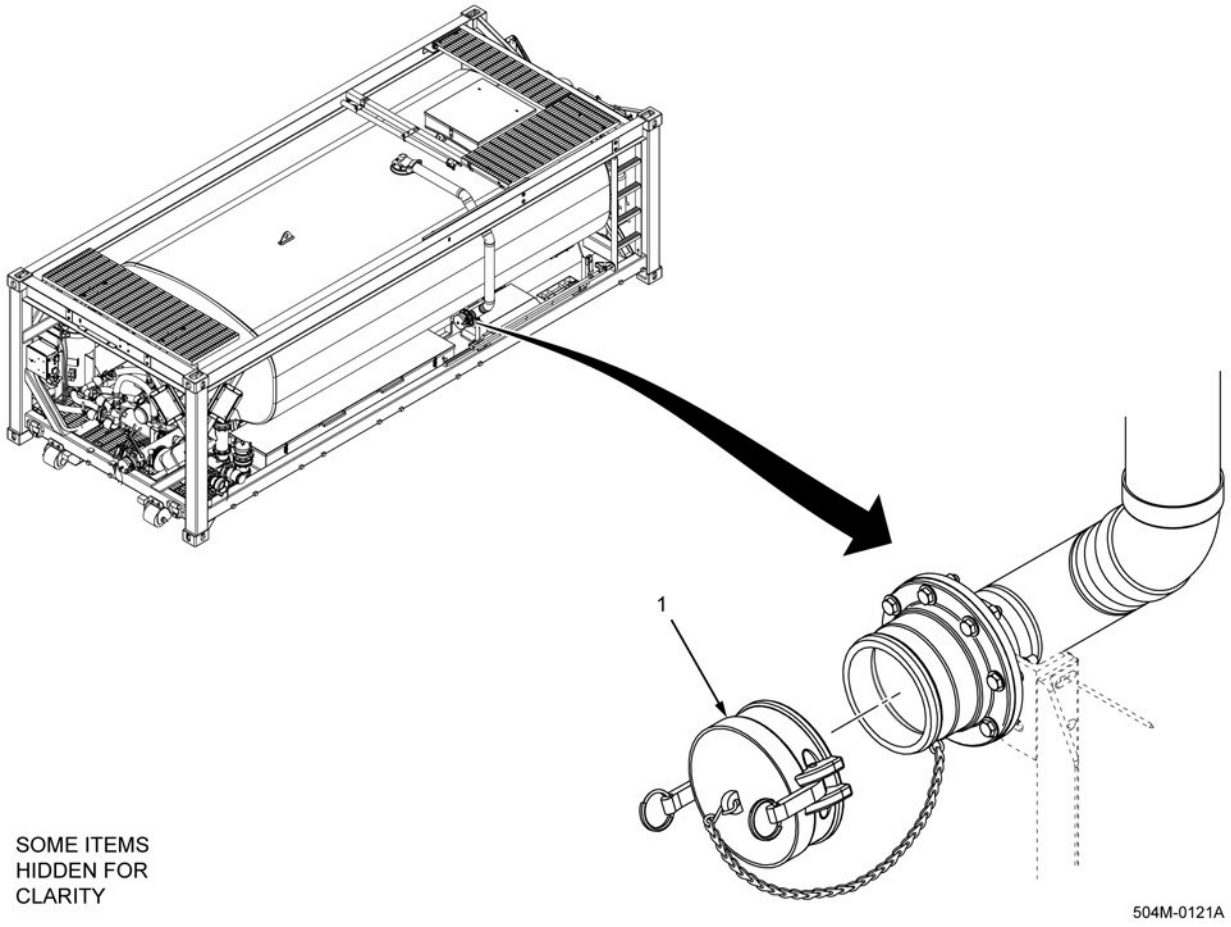


Figure 9. Installing Vapor Recovery Line Dust Cap.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Set up MFS TRM (TM 10-4930-371-10).
2. Check MFS TRM for leaks by recirculating fuel (TM 10-4930-371-10).

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
FILTER/SEPARATOR ASSEMBLY ELEMENTS AND LID GASKET REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposable nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)
- Pan, drip (WP 0217, Table 1, Item 8)
- Respirator (WP 0216, Table 1, Item 11)
- Socket, 1 5/8 inch (WP 0217, Table 1, Item 12)
- Wrench, socket, 3/4 inch drive (WP 0217, Table 1, Item 21)

Materials/Parts
- Absorbent material (WP 0216, Table 1, Item 1)
- Cloth, cleaning (WP 0216, Table 1, Item 4)
- Cleaning compound, solvent (WP 0216, Table 1, Item 3)
- Petrolatum, technical (WP 0216, Table 1, Item 10)
- Washer, lock Qty: 2 (WP 0205, Figure 59, Item 59)
- Filter element, fluid Qty: 2 (WP 0205, Figure 59, Item 47)

Materials/Parts (cont.)
- Filter element, fluid Qty: 2 (WP 0205, Figure 59, Item 48)
- Gasket (WP 0205, Figure 59, Item 50)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer (2)

References
- ATP 4-43
- TM 10-4930-371-10

Equipment Condition
- MFS TRM grounded (TM 10-4930-371-10)
- MFS TRM shut down (TM 10-4930-371-10)
- Filter/Separator drained (TM 10-4930-371-10)

Time to Complete
- 1.5 Hour(s)

FILTER/SEPARATOR FILTER ELEMENTS REMOVAL

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Failure to comply could result in injury or death to personnel.

FILTER/SEPARATOR FILTER ELEMENTS REMOVAL - Continued

1. Place drip pan under filter/separator assembly to catch residual fuel.
2. Remove vapor recovery line dust cap (Figure 1, Item 2).
3. Momentarily open then close V1 bottom loading valve (Figure 1, Item 1) to vent tank pressure.

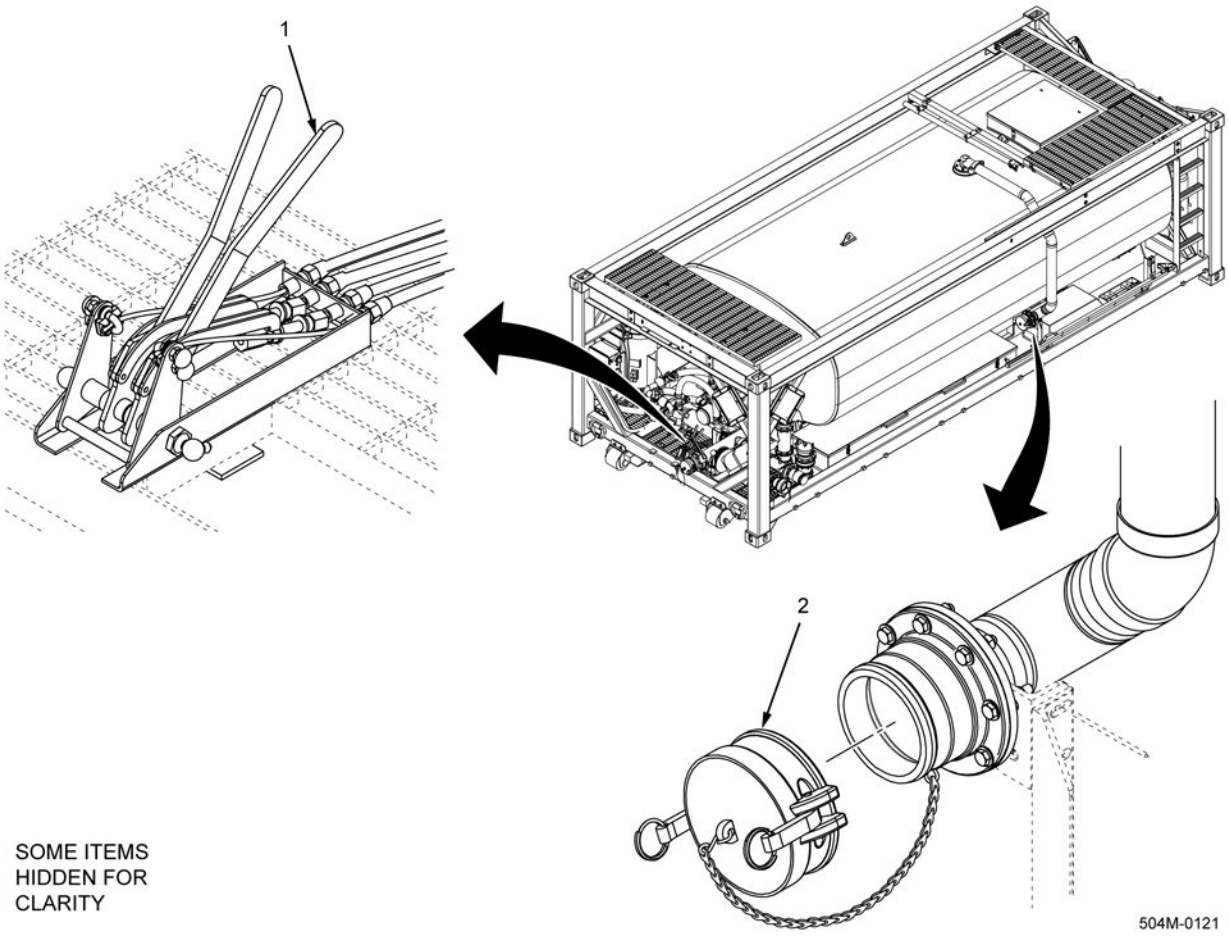


Figure 1. Fuel System Venting.

4. Remove two nuts (Figure 2, Item 5), flat washers (Figure 2, Item 2), and bolt (Figure 2, Item 1) to release ring clamp (Figure 2, Item 4) from side brace bracket (Figure 2, Item 6).

FILTER/SEPARATOR FILTER ELEMENTS REMOVAL - Continued

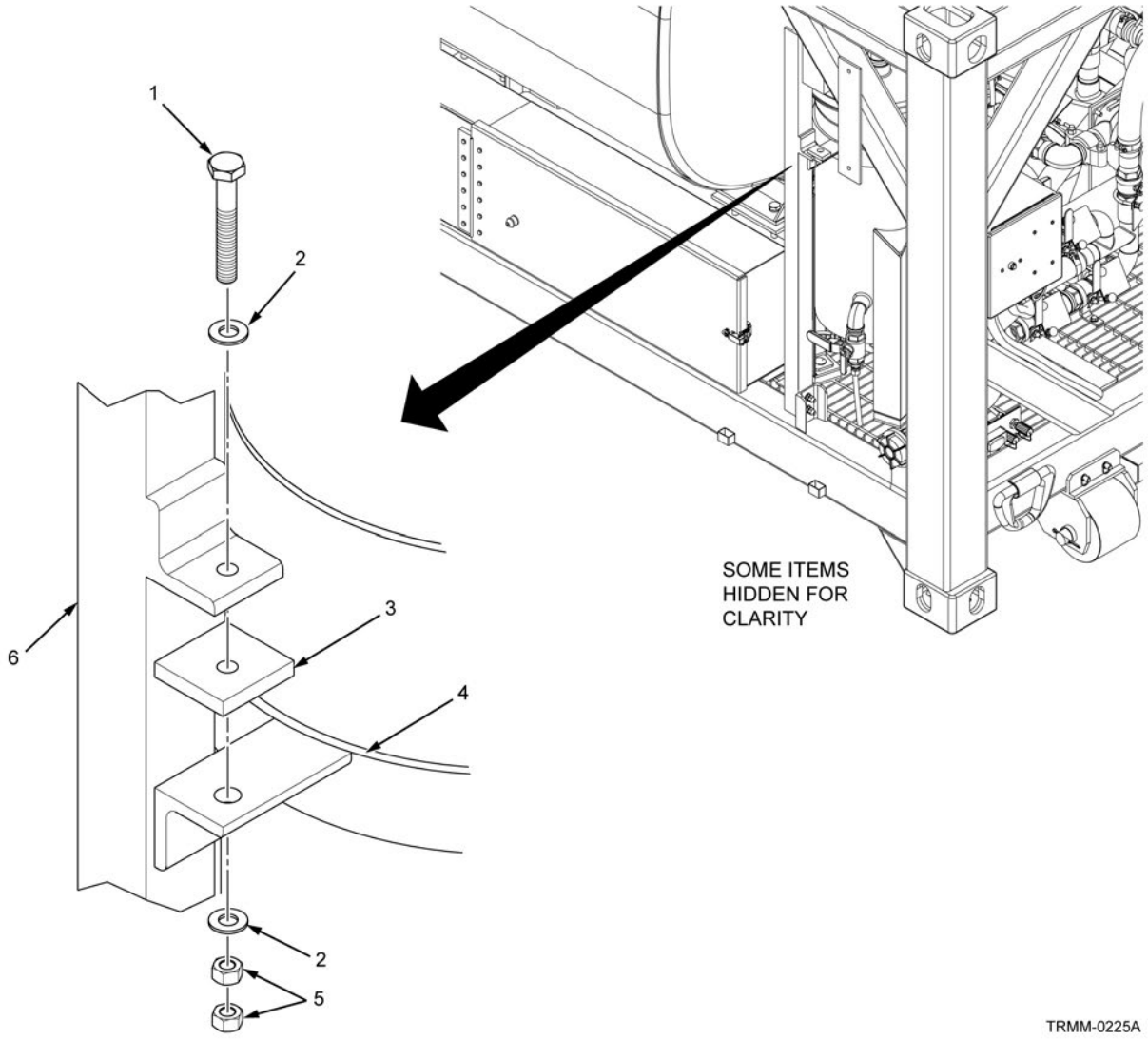


Figure 2. Detaching Ring Clamp.

5. At bottom of filter/separator assembly, remove four nuts (Figure 3, Item 1), flat washers (Figure 3, Item 2), and two bolts (Figure 3, Item 3) securing side brace (Figure 3, Item 5) to frame (Figure 3, Item 4).
6. At top of filter/separator assembly, remove four nuts (Figure 3, Item 1), flat washers (Figure 3, Item 2), and two bolts (Figure 3, Item 3) securing side brace (Figure 3, Item 5) to frame (Figure 3, Item 4).
7. Remove side brace bracket (Figure 2, Item 6) and rubber pad (Figure 2, Item 3). Set side brace bracket (Figure 2, Item 6) aside.

FILTER/SEPARATOR FILTER ELEMENTS REMOVAL - Continued

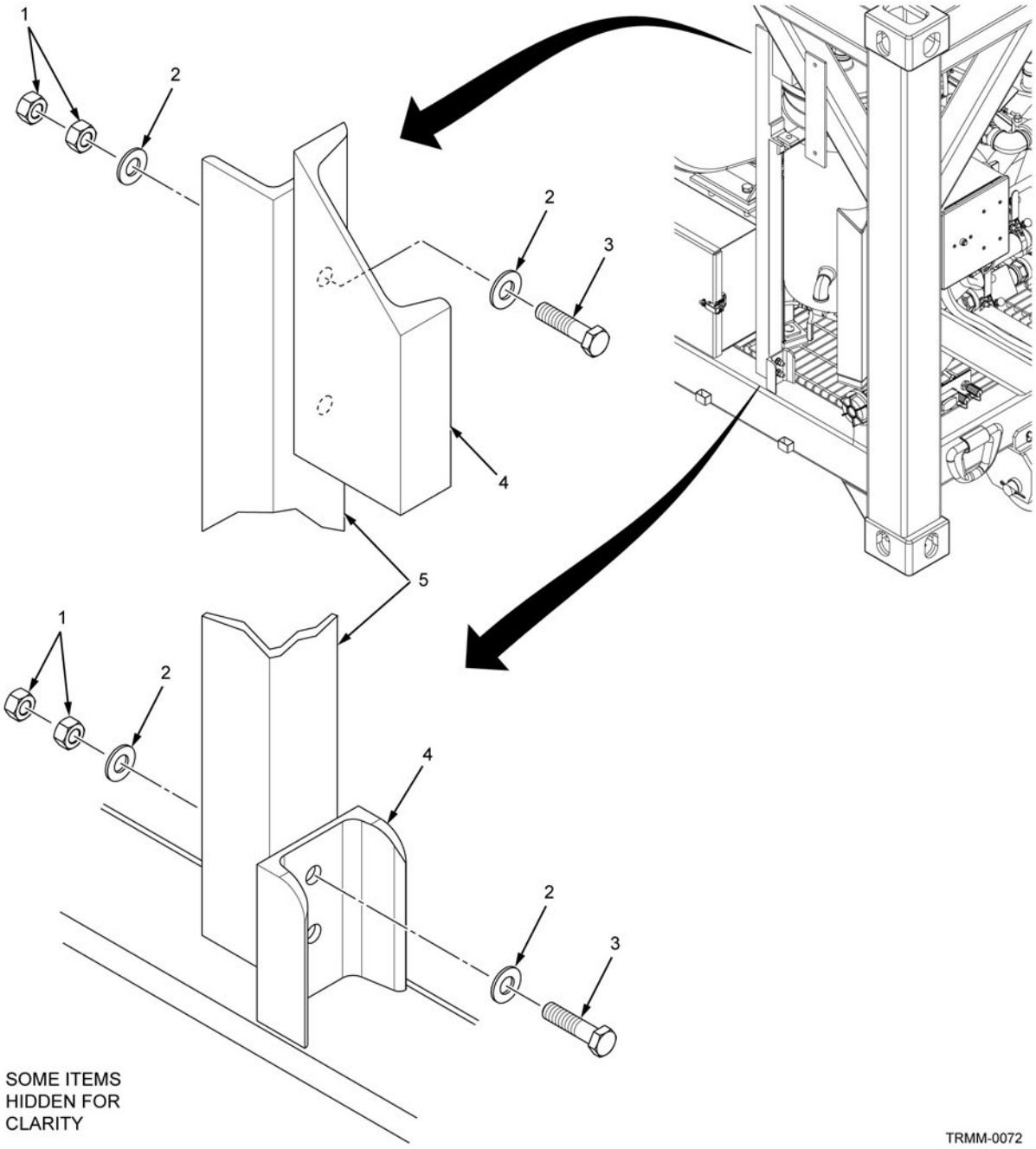


Figure 3. Detaching Angle Brace.

FILTER/SEPARATOR FILTER ELEMENTS REMOVAL - Continued

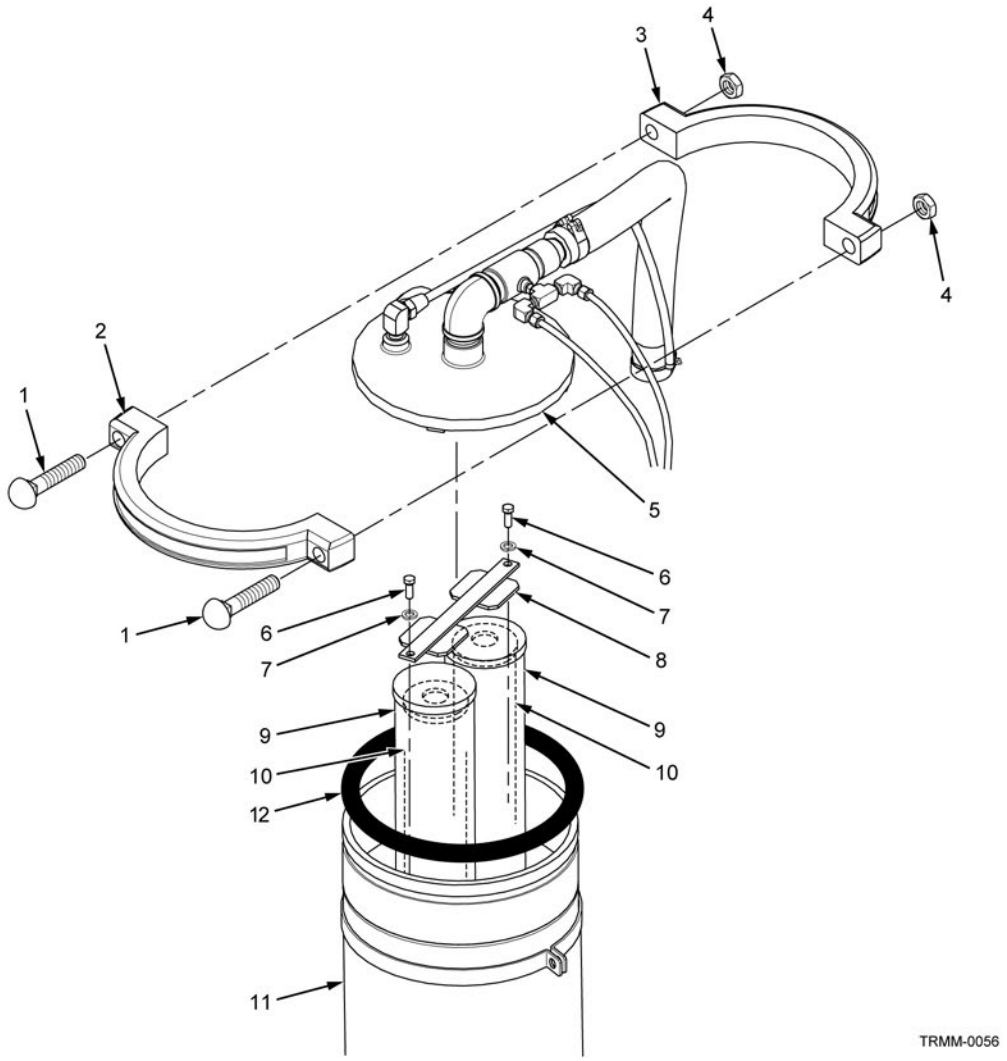


Figure 4. Filter/Separator Elements.

8. Make a mark on lid coupling halves (Figure 4, Items 2 and 3) and lid assembly (Figure 4, Item 5) to indicate proper position for installation.
9. Remove two bolts (Figure 4, Item 1) and nuts (Figure 4, Item 4) and remove lid coupling halves (Figure 4, Items 2 and 3).

FILTER/SEPARATOR FILTER ELEMENTS REMOVAL - Continued

WARNING

JP8/F24 fuel is toxic and can affect the respiratory tract with prolonged breathing. Personnel must wear a respirator while working with the lid removed from the filter/separator assembly. Failure to comply can result in injury or death to personnel.

CAUTION

- Inside surfaces of lid assembly should not be touched to minimize the possibility of contamination of the filter/separator unit.
- Tubing and flexible hose will remain connected to filter/separator lid in following step. Take care not to damage or pull loose tubing connected to filter/separator lid assembly during removal.

10. Remove filter/separator lid assembly (Figure 4, Item 5) and set aside.
11. Remove 12-inch gasket (Figure 4, Item 12) from filter/separator assembly (Figure 4, Item 11). Discard 12-inch gasket.
12. Remove two bolts (Figure 4, Items 6), lock washers (Figure 4, Item 7) and remove spider (Figure 4, Item 8). Discard lock washers.
13. Lift both screens (Figure 4, Item 9) and two filter element assemblies (Figure 4, Item 10) out of filter/separator assembly (Figure 4, Item 11).
14. Remove filter elements (Figure 4, Item 10) from inside screen (Figure 4, Item 9).
15. Dispose of contaminated filter elements (Figure 4, Item 10) IAW unit SOP.
16. Remove drip pan and dispose of fuel IAW unit SOP.

END OF TASK

CLEANING

WARNING

Solvent cleaning compound MIL-PRF-680 Type III is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Keep away from open flames and other sources of ignition. Failure to comply may cause injury to personnel.

1. Clear debris from coalescer elements and inside filter/separator.
2. Clean all metal parts with a cleaning cloth and solvent cleaning compound.
3. Allow parts to dry thoroughly.

END OF TASK

INSPECT SCREENS

1. Inspect screens (Figure 4, Item 9) for visible wear or damage.
2. Replace screens if damage is found.

END OF TASK

FILTER/SEPARATOR FILTER ELEMENTS INSTALLATION

1. Lubricate o-rings (Figure 5, Item 1) on top and bottom of new filter elements (Figure 5, Item 2) with petrolatum.
2. Ensure o-rings (Figure 5, Item 1) are securely in place.

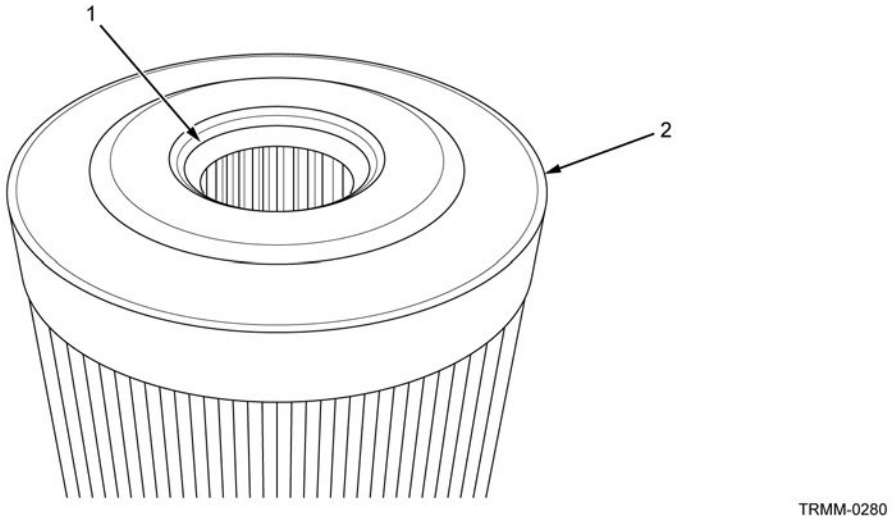


Figure 5. Filter/Separator Element O-Rings Installation.

3. Install two new filter elements (Figure 6, Item 10) in filter/separator assembly (Figure 6, Item 11).
4. Install two screens (Figure 6, Item 9), over filter elements (Figure 6, Items 10) ensuring that filter elements (Figure 6, Item 10) seat properly.
5. Install spider (Figure 6, Item 8) and secure with two bolts (Figure 6, Item 6) and new lock washers (Figure 6, Item 7).
6. Lightly lubricate new 12-inch gasket (Figure 6, Item 12) with fuel.
7. Install 12-inch gasket (Figure 6, Item 12) on filter/separator assembly (Figure 6, Item 11).
8. Install lid assembly (Figure 6, Item 5).
9. Slide 12-inch gasket (Figure 6, Item 12) up centering it over the gap between the lid assembly (Figure 6, Item 5) and the filter/separator assembly (Figure 6, Item 11).
10. Install lid coupling halves (Figure 6, Items 2 and 3), ensuring that they are aligned with the mark on the filter/separator assembly (Figure 6, Item 11) as noted during removal.
11. Loosely install two bolts (Figure 6, Item 1), and nuts (Figure 6, Item 4).
12. Alternately tighten two nuts (Figure 6, Item 4) until metal surfaces of coupling halves (Figure 6, Items 2 and 3) contact each other.

FILTER/SEPARATOR FILTER ELEMENTS INSTALLATION - Continued

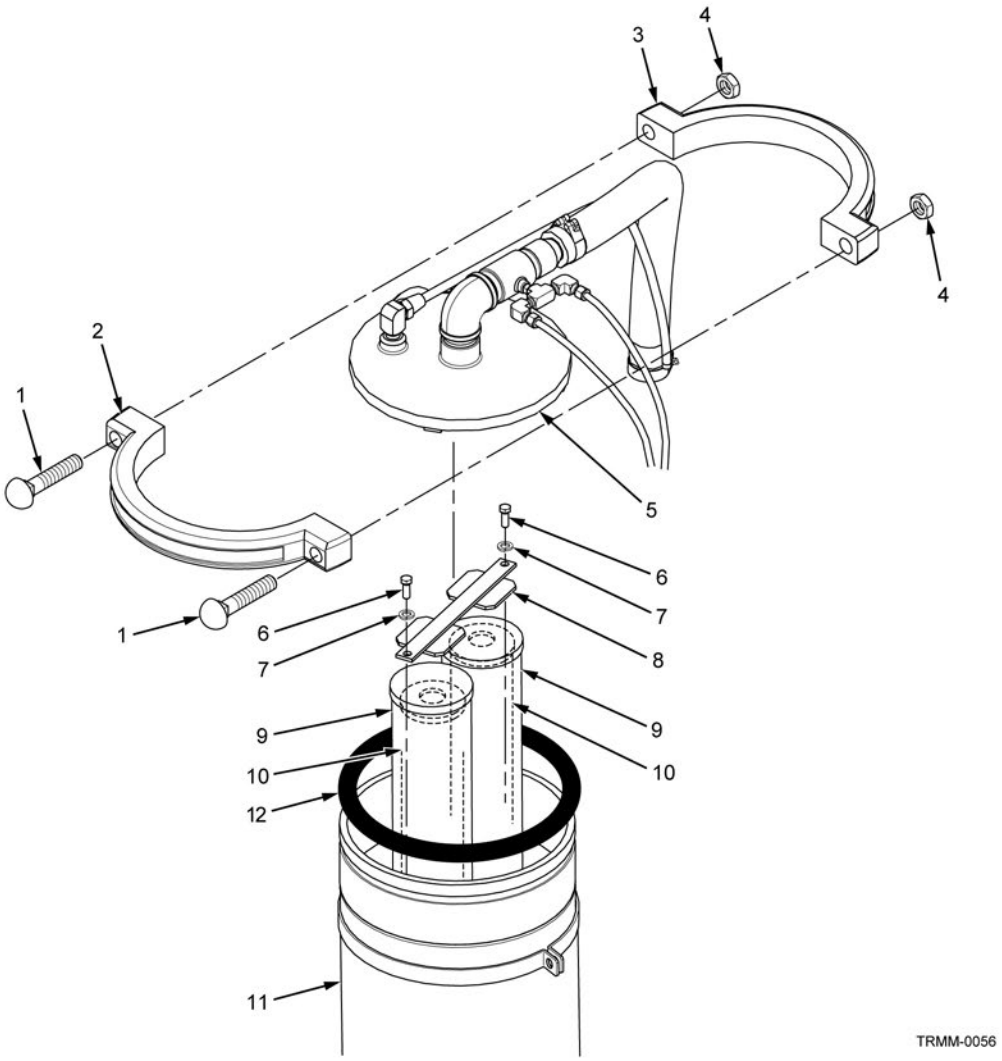


Figure 6. Filter/Separator Elements.

NOTE

Only two nuts are replaced in the following step. Jam nuts will be installed later.

13. Install top of side brace bracket (Figure 7, Item 5) to frame (Figure 7, Item 4) and loosely secure with two bolts (Figure 7, Item 3), four flat washers (Figure 7, Item 2), and nuts (Figure 7, Item 1).

14. Install rubber pad (Figure 8, Item 3) between side brace bracket (Figure 8, Item 7) and ring clamp bracket (Figure 8, Item 6).

FILTER/SEPARATOR FILTER ELEMENTS INSTALLATION - Continued

NOTE

Only two nuts are replaced in the following step. Jam nuts will be installed later.

15. Install bottom of side brace bracket (Figure 7, Item 5) to frame (Figure 7, Item 4) and loosely secure with two bolts (Figure 7, Item 3), four flat washers (Figure 7, Item 2), and two nuts (Figure 7, Item 1).

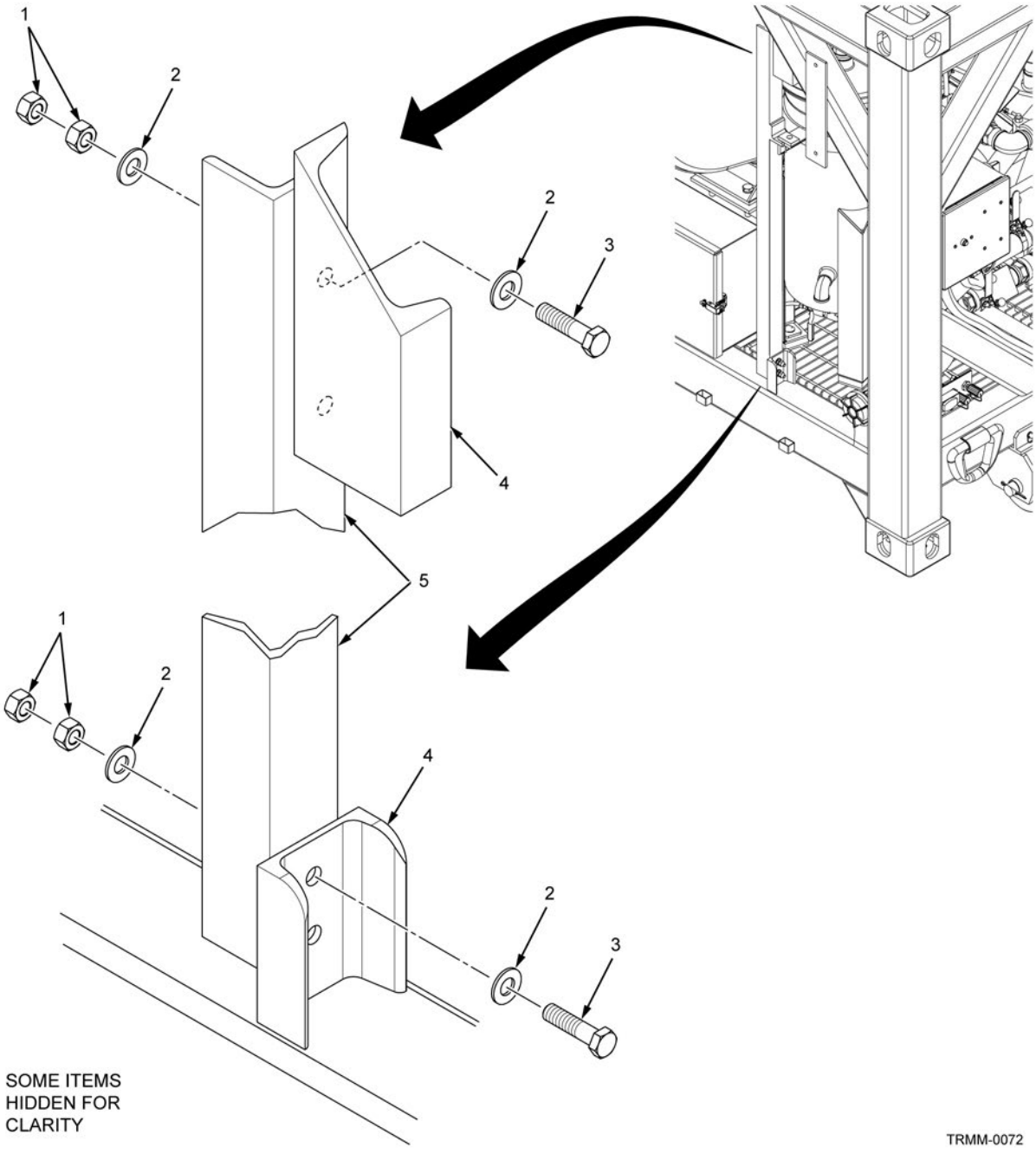


Figure 7. Installing Angle Brace.

FILTER/SEPARATOR FILTER ELEMENTS INSTALLATION - Continued

NOTE

Only one nut is replaced in the following step. A jam nut will be installed later.

16. Install bolt (Figure 8, Item 1), two flat washers (Figure 8, Item 2) and loosely secure ring clamp bracket (Figure 8, Item 6) to side brace bracket (Figure 8, Item 7) with two nuts (Figure 8, Item 5).
17. Tighten two nuts (Figure 7, Item 1) at top of side brace (Figure 7, Item 5).
18. Install and tighten two jam nuts (Figure 7, Item 1) at top of side brace (Figure 7, Item 5).
19. Tighten two nuts (Figure 7, Item 1) at bottom of side brace (Figure 7, Item 5).
20. Install and tighten two jam nuts (Figure 7, Item 1) at bottom of side brace (Figure 7, Item 5).
21. Tighten nut (Figure 8, Item 5) securing side brace bracket (Figure 8, Item 7) to ring clamp bracket (Figure 8, Item 6) on ring clamp (Figure 8, Item 4).
22. Install and tighten jam nut (Figure 8, Item 5) on bolt (Figure 8, Item 1).

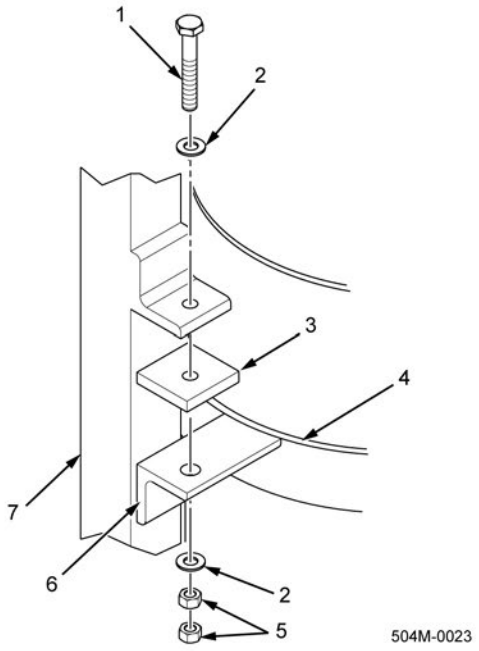


Figure 8. Securing Ring Clamp.

FILTER/SEPARATOR FILTER ELEMENTS INSTALLATION - Continued

23. Install vapor recovery line dust cap (Figure 9, Item 1).

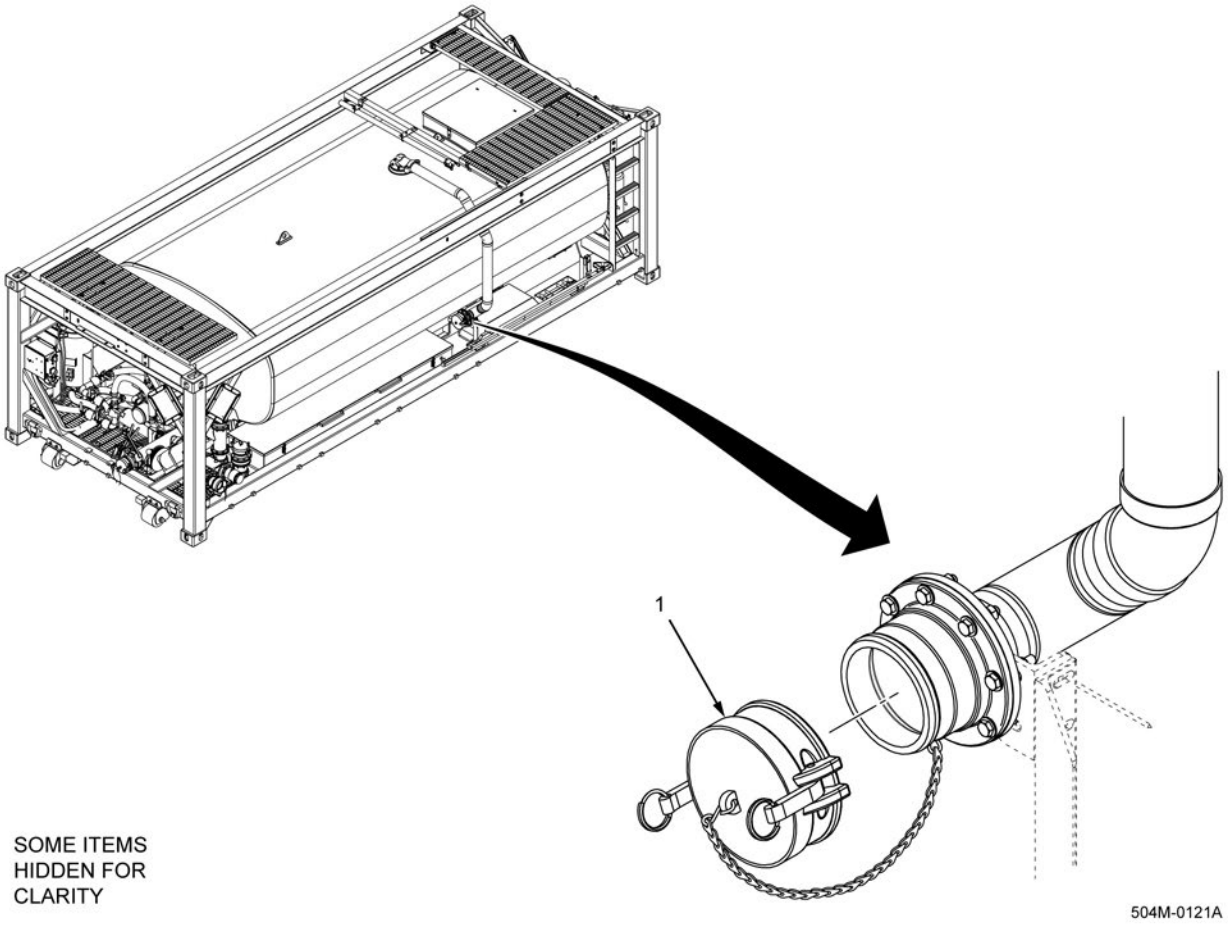


Figure 9. Installing Vapor Recovery Line Dust Cap.

END OF TASK

FILTER/SEPARATOR LID GASKET REMOVAL

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Failure to comply could result in injury or death to personnel.

1. Place drip pan under filter/separator assembly to catch residual fuel.
2. Remove vapor recovery line dust cap (Figure 10, Item 2).
3. Momentarily open then close V1 bottom loading valve (Figure 10, Item 1) to vent tank pressure.

FILTER/SEPARATOR LID GASKET REMOVAL - Continued

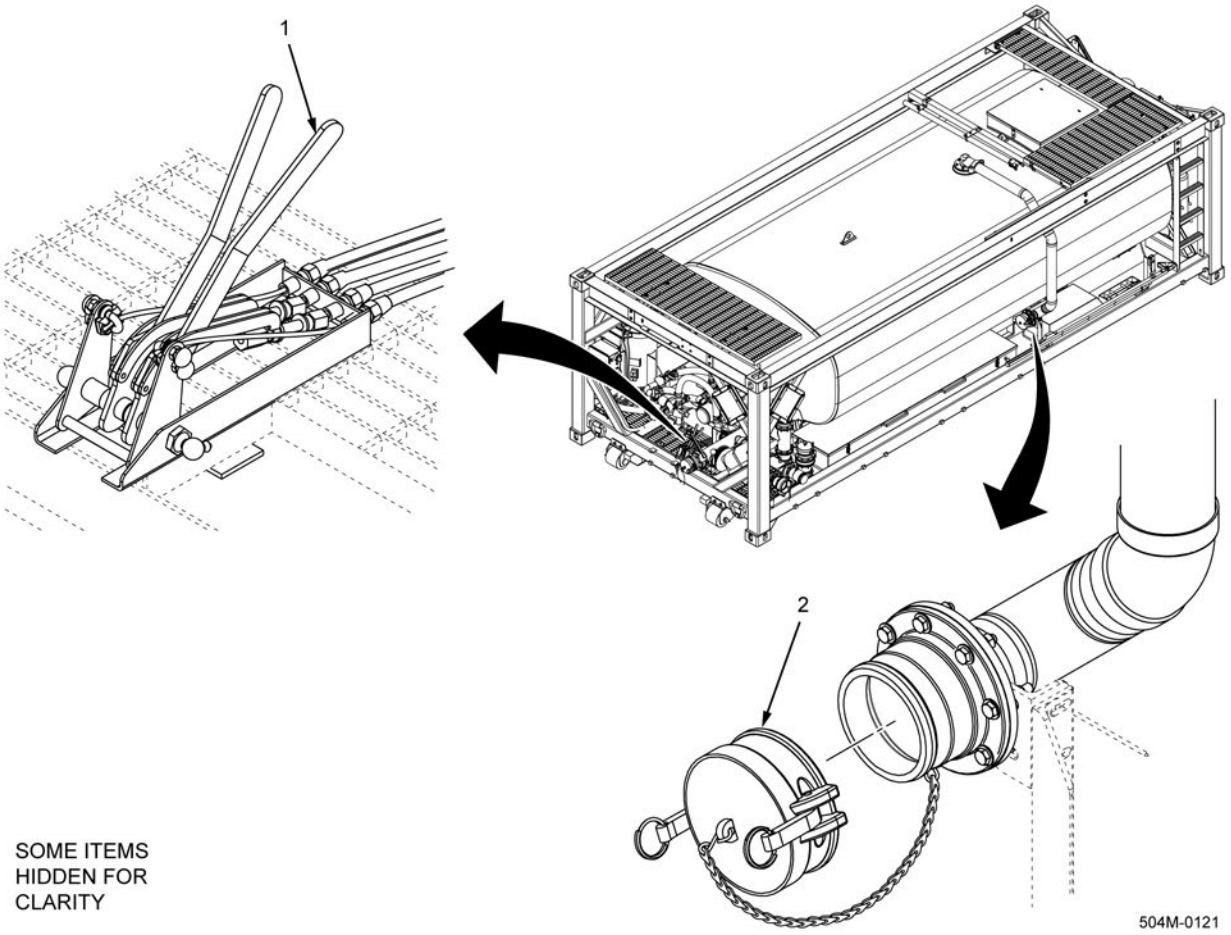


Figure 10. Fuel System Venting.

4. Remove two nuts (Figure 11, Item 10), flat washers (Figure 11, Item 9), and bolt (Figure 11, Item 17) to release ring clamp (Figure 11, Item 8) from side brace bracket (Figure 11, Item 15).
5. At bottom of filter/separator assembly, remove four nuts (Figure 11, Item 14), flat washers (Figure 11, Item 12), and two bolts (Figure 11, Item 13) securing side brace (Figure 11, Item 15) to frame (Figure 11, Item 11).

FILTER/SEPARATOR LID GASKET REMOVAL - Continued

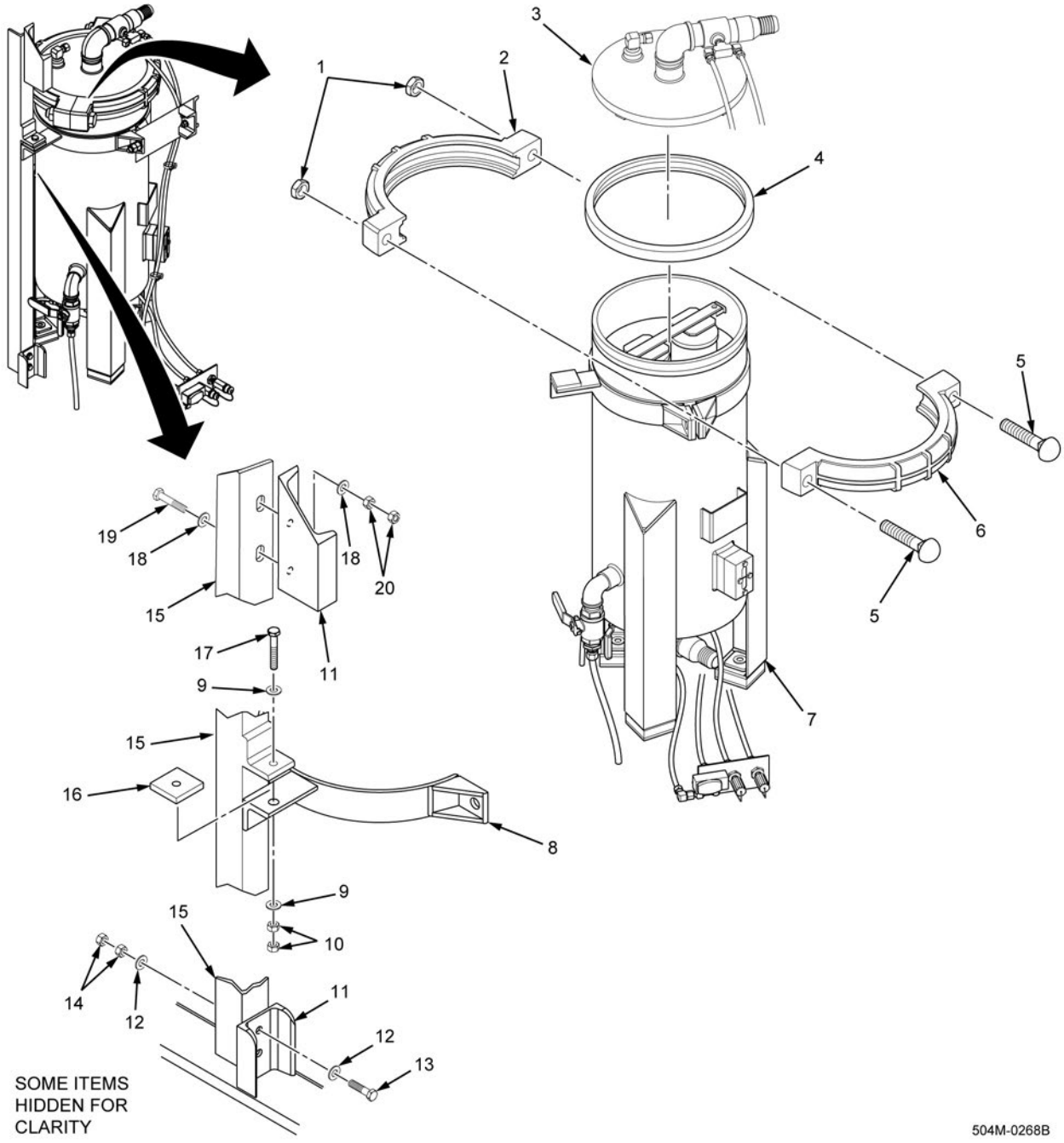


Figure 11. Removing Filter/Separator Gasket.

6. At top of filter/separator assembly, remove four nuts (Figure 11, Item 20), flat washers (Figure 11, Item 18), and two bolts (Figure 11, Item 19) securing side brace (Figure 11, Item 15) to frame (Figure 11, Item 11).
7. Remove side brace bracket (Figure 11, Item 15) and rubber pad (Figure 11, Item 16). Set side brace bracket (Figure 11, Item 15) aside.

FILTER/SEPARATOR LID GASKET REMOVAL - Continued

8. Make a mark on lid coupling halves (Figure 11, Items 2 and 6) and lid assembly (Figure 11, Item 3) to indicate proper position for installation.
9. Remove two bolts (Figure 11, Item 5) and nuts (Figure 11, Item 1) and remove lid coupling halves (Figure 11, Items 2 and 6).

WARNING

JP8/F24 fuel is toxic and can affect the respiratory tract with prolonged breathing. Personnel must wear a respirator while working with the lid removed from the filter/separator assembly. Failure to comply can result in injury or death to personnel.

CAUTION

- Inside surfaces of lid assembly should not be touched to minimize the possibility of contamination of the filter/separator unit.
- Tubing and flexible hose will remain connected to filter/separator lid in following step. Take care not to damage or pull loose tubing connected to filter/separator lid assembly during removal.

10. Remove filter/separator lid assembly (Figure 11, Item 3) and set aside.
11. Remove 12-inch gasket (Figure 11, Item 4) from filter/separator assembly (Figure 11, Item 7). Discard 12-inch gasket.
12. Remove drip pan and dispose of fuel IAW unit SOP.

END OF TASK

FILTER/SEPARATOR LID GASKET INSTALLATION

1. Lightly lubricate new 12-inch gasket (Figure 12, Item 4) with fuel.
2. Install 12-inch gasket (Figure 12, Item 4) on filter/separator assembly (Figure 12, Item 7).
3. Install lid assembly (Figure 12, Item 3).
4. Slide 12-inch gasket (Figure 12, Item 4) up centering it over the gap between the lid assembly (Figure 12, Item 3) and the filter/separator assembly (Figure 12, Item 7).
5. Install lid coupling halves (Figure 12, Items 2 and 6), ensuring that they are aligned with the mark on the filter/separator assembly (Figure 12, Item 7) as noted during removal.

FILTER/SEPARATOR LID GASKET INSTALLATION - Continued

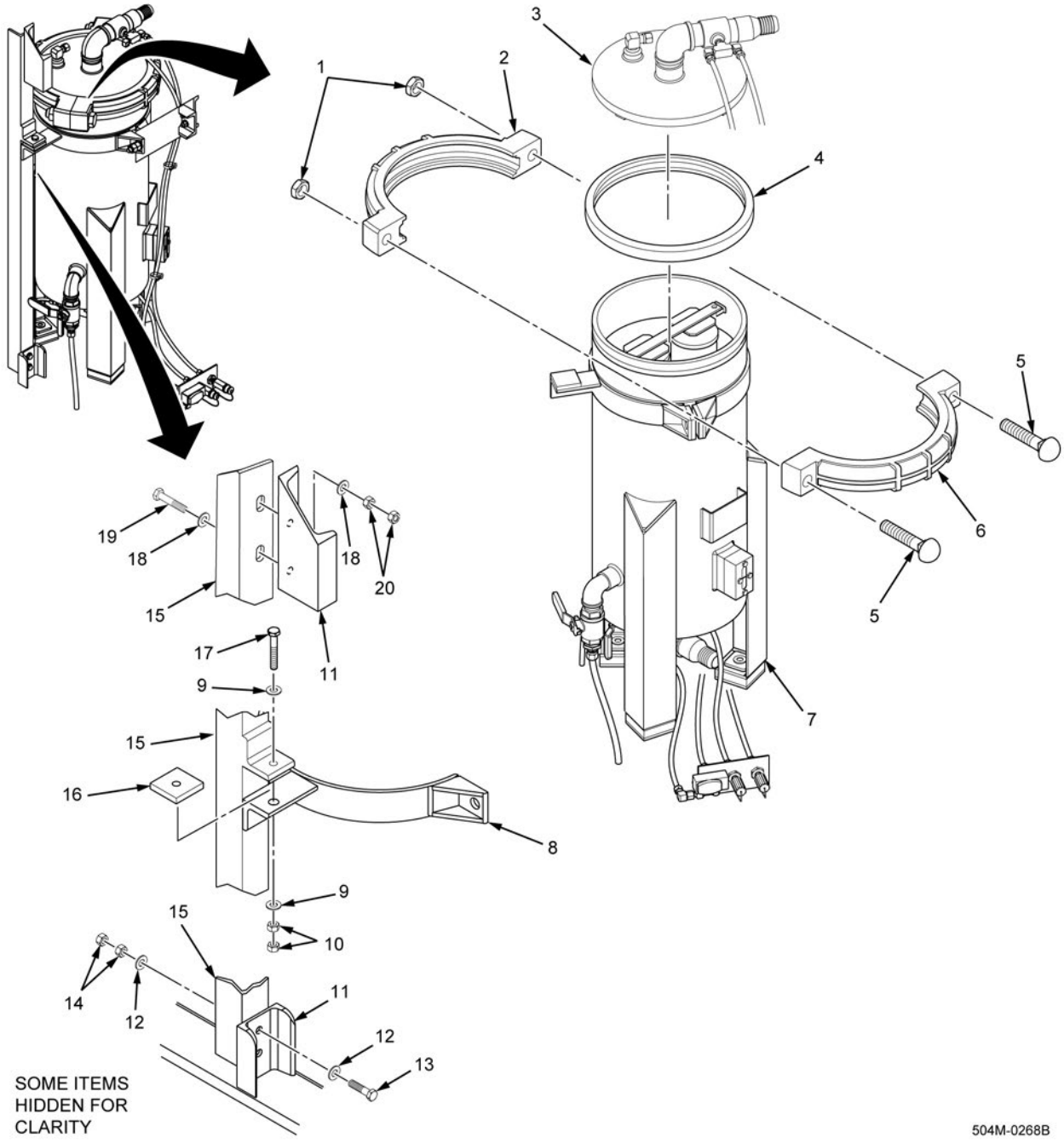


Figure 12. Installing Filter/Separator Gasket.

6. Loosely install two bolts (Figure 12, Item 5), and nuts (Figure 12, Item 1).
7. Alternately tighten two nuts (Figure 12, Item 1) until metal surfaces of coupling halves (Figure 12, Items 2 and 6) contact each other.

FILTER/SEPARATOR LID GASKET INSTALLATION - Continued

NOTE

Only two nuts are replaced in the following step. Jam nuts will be installed later.

8. Install top of side brace bracket (Figure 12, Item 15) to frame (Figure 12, Item 11) and loosely secure with two bolts (Figure 12, Item 19), four flat washers (Figure 12, Item 18), and two nuts (Figure 12, Item 20).
9. Install rubber pad (Figure 12, Item 16) between side brace bracket (Figure 12, Item 15) and ring clamp bracket (Figure 12, Item 8).

NOTE

Only two nuts are replaced in the following step. Jam nuts will be installed later.

10. Install bottom of side brace bracket (Figure 12, Item 15) to frame (Figure 12, Item 11) and loosely secure with two bolts (Figure 12, Item 13), four flat washers (Figure 12, Item 12), and two nuts (Figure 12, Item 14).

NOTE

Only one nut is replaced in the following step. A jam nut will be installed later.

11. Install bolt (Figure 12, Item 17), two flat washers (Figure 12, Item 9) and loosely secure ring clamp bracket (Figure 12, Item 8) to side brace bracket (Figure 12, Item 15) with two nuts (Figure 12, Item 10).
12. Tighten two nuts (Figure 12, Item 20) at top of side brace (Figure 12, Item 15).
13. Install and tighten two jam nuts (Figure 12, Item 20) at top of side brace (Figure 12, Item 15).
14. Tighten two nuts (Figure 12, Item 14) at bottom of side brace (Figure 12, Item 15).
15. Install and tighten two jam nuts (Figure 12, Item 14) at bottom of side brace (Figure 12, Item 15).
16. Tighten nut (Figure 12, Item 10) securing side brace bracket (Figure 12, Item 15) to ring clamp bracket (Figure 12, Item 8) on ring clamp (Figure 12, Item 8).
17. Install and tighten jam nut (Figure 12, Item 10) on bolt (Figure 12, Item 17).
18. Install vapor recovery line dust cap (Figure 13, Item 1).

FILTER/SEPARATOR LID GASKET INSTALLATION - Continued

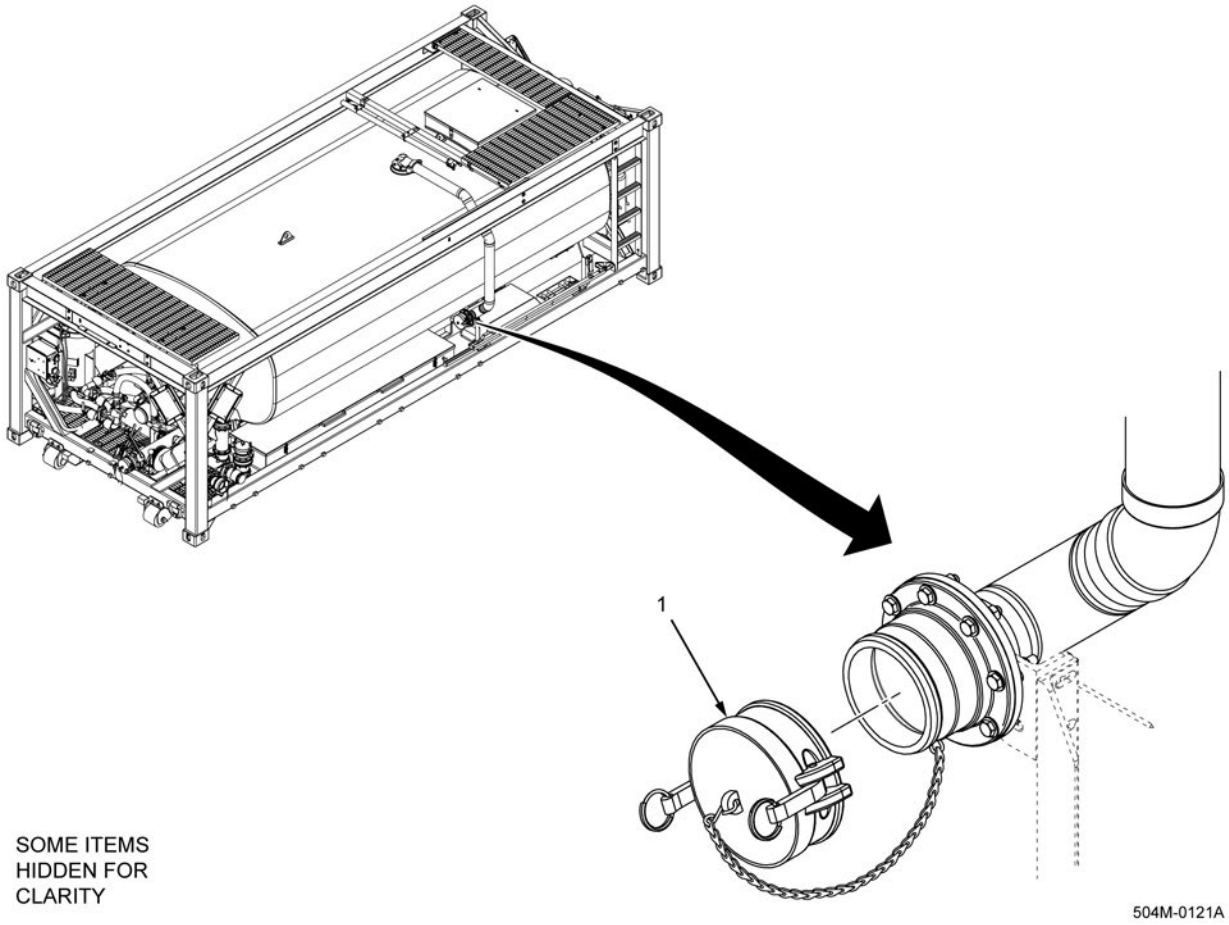


Figure 13. Installing Vapor Recovery Line Dust Cap.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Set up MFS TRM (TM 10-4930-371-10).
2. Check MFS TRM for leaks by recirculating fuel (TM 10-4930-371-10).

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
FILTER/SEPARATOR FUEL DRAIN VALVE ASSEMBLY REPAIR

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposable nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)
- Pan, drip (WP 0217, Table 1, Item 8)

Materials/Parts
- Absorbent material (WP 0216, Table 1, Item 1)
- Cleaning compound, solvent (WP 0216, Table 1, Item 3)
- Cloth, cleaning (WP 0216, Table 1, Item 4)
- Thread sealing compound (WP 0216, Table 1, Item 15)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer

References
- ATP 4-43
- TM 10-4930-371-10

Equipment Condition
- MFS TRM grounded (TM 10-4930-371-10)
- MFS TRM on ground (TM 10-4930-371-10)
- Filter/Separator drained (TM 10-4930-371-10)

Time to Complete
- 0.5 Hour(s)

DISASSEMBLY

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Failure to comply could result in injury or death to personnel.

NOTE

Note orientation of hardware and components to aid in installation.

1. Remove vapor recovery line dust cap (Figure 1, Item 2).
2. Momentarily open then close bottom loading valve (V1) (Figure 1, Item 1) to vent tank pressure.

DISASSEMBLY - Continued

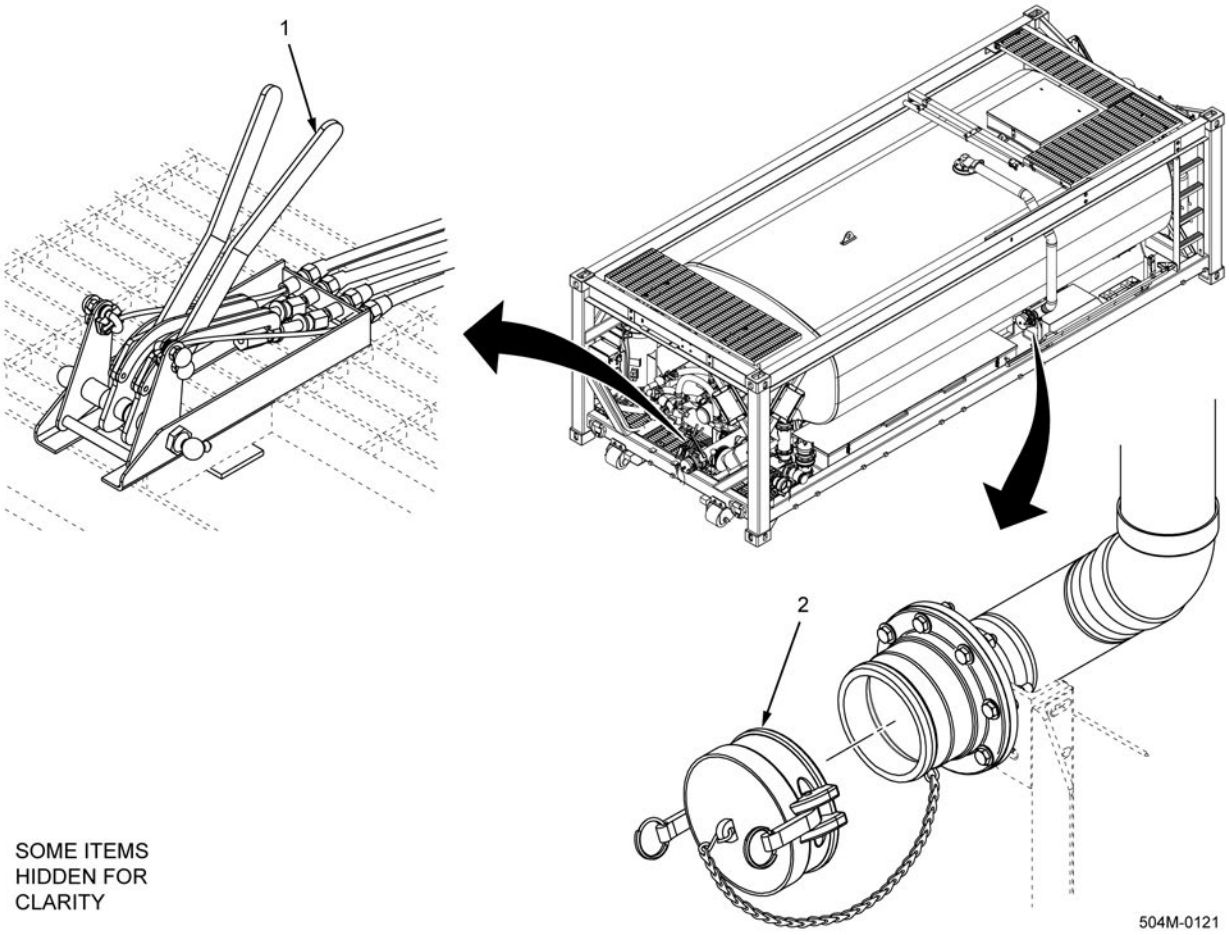


Figure 1. Fuel System Venting.

3. Place drip pan under filter/separator to catch residual fuel.
4. Open handle (Figure 2, Item 10) to drain excess fuel.
5. Close handle (Figure 2, Item 10).
6. Remove nut (Figure 2, Item 12) and handle (Figure 2, Item 10) from valve (Figure 2, Item 9).
7. Unscrew tube nuts (Figure 2, Item 4) from straight fittings (Figure 2, Item 6).
8. Remove lines (Figure 2, Items 3 and 11), tube nuts (Figure 2, Item 4), and ferrules (Figure 2, Item 5) from straight fittings (Figure 2, Item 6).
9. Remove straight fitting (Figure 2, Item 6) from valve (Figure 2, Item 9).
10. Remove valve (Figure 2, Item 9) from nipple (Figure 2, Item 8).
11. Remove nipple (Figure 2, Item 8) from tee (Figure 2, Item 7).
12. Remove tee (Figure 2, Item 7) from nipple (Figure 2, Item 1).
13. Remove nipple (Figure 2, Item 6) from tee (Figure 2, Item 7).
14. Remove nipple (Figure 2, Item 1) from bottom of filter/separator weldment (Figure 2, Item 2).

DISASSEMBLY - Continued

15. Remove drip pan and dispose of fuel IAW unit SOP.

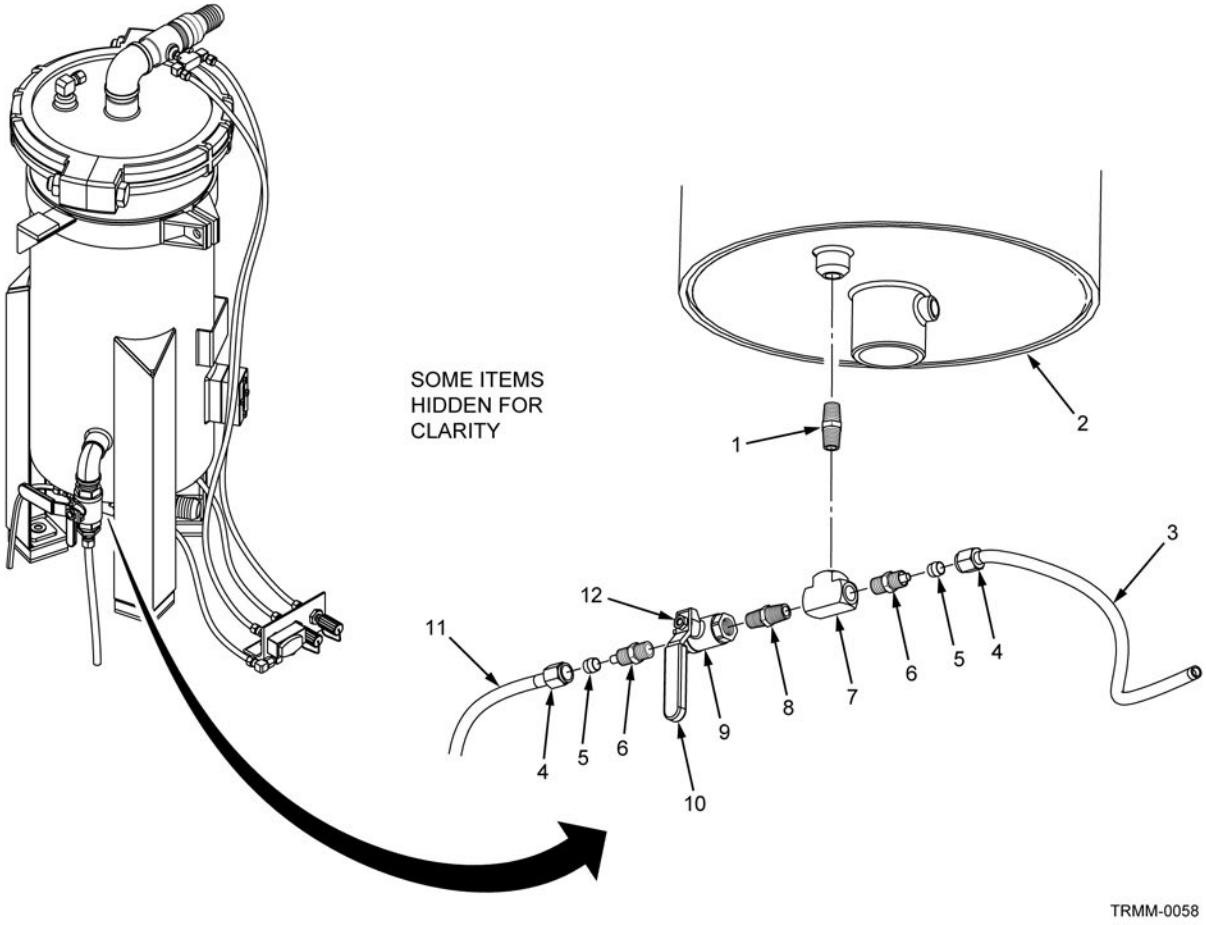


Figure 2. Repairing Fuel Drain Valve Assembly.

END OF TASK

CLEANING

WARNING

Solvent cleaning compound MIL-PRF-680 Type III is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Keep away from open flames and other sources of ignition. Failure to comply may cause injury to personnel.

1. Clean any residual thread sealant from threads of all components.

CLEANING - Continued

2. Clean all metal parts with a cleaning cloth and solvent cleaning compound.
3. Allow parts to dry thoroughly.

END OF TASK

ASSEMBLY

WARNING

Thread sealing compound is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Failure to comply may cause injury to personnel.

1. Apply thread sealing compound to all adapter threads and valve side of fittings (Figure 2, Item 6). Do not apply thread sealing compound to tube nuts (Figure 2, Item 4) or ferrules (Figure 2, Item 5).
2. Install nipple (Figure 2, Item 1) in bottom of filter/separator weldment (Figure 2, Item 2).
3. Install tee (Figure 2, Item 7) on nipple (Figure 2, Item 1).
4. Install nipple (Figure 2, Item 8) on tee (Figure 2, Item 7).
5. Install valve (Figure 2, Item 9) on nipple (Figure 2, Item 8).
6. Install straight fitting (Figure 2, Item 6) on valve (Figure 2, Item 9).
7. If necessary, install new ferrule (Figure 2, Item 5) and new tube nut (Figure 2, Item 4) on line (Figure 2, Item 11).
8. Install fuel drain line (Figure 2, Item 11) on straight fitting (Figure 2, Item 6). Tighten tube nut (Figure 2, Item 4).
9. Install straight fitting (Figure 2, Item 6) into tee (Figure 2, Item 7).
10. If necessary, install new ferrule (Figure 2, Item 5) and new tube nut (Figure 2, Item 4) on line (Figure 2, Item 3).
11. Install differential pressure line (Figure 2, Item 3) on straight fitting (Figure 2, Item 6). Tighten tube nut (Figure 2, Item 4).
12. Install handle (Figure 2, Item 10) on valve (Figure 2, Item 9) and secure with nut (Figure 2, Item 12).
13. Place handle (Figure 2, Item 10) in closed position.
14. Install vapor recovery line dust cap (Figure 1, Item 2).

END OF TASK

FOLLOW-ON MAINTENANCE

1. Set up MFS TRM (TM 10-4930-371-10).

FOLLOW-ON MAINTENANCE - Continued

2. Check MFS TRM for leaks by recirculating fuel (TM 10-4930-371-10).

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
FILTER/SEPARATOR WATER DRAIN VALVE ASSEMBLY REPAIR

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposable nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)
- Pan, drip (WP 0217, Table 1, Item 8)
- Wrench, internal pipe (WP 0217, Table 1, Item 18)
- Wrench, pipe, 18 inch (WP 0217, Table 1, Item 19)

Materials/Parts
- Absorbent material (WP 0216, Table 1, Item 1)
- Cleaning compound, solvent (WP 0216, Table 1, Item 3)
- Cloth, cleaning (WP 0216, Table 1, Item 4)
- Thread sealing compound (WP 0216, Table 1, Item 15)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer

References
- ATP 4-43

Equipment Condition
- MFS TRM grounded (TM 10-4930-371-10)
- Filter/Separator drained (TM 10-4930-371-10)

Time to Complete
- 0.5 Hour(s)

DISASSEMBLY

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Failure to comply could result in injury or death to personnel.

NOTE

Note orientation of hardware and components to aid in installation.

DISASSEMBLY - Continued

1. Remove vapor recovery line dust cap (Figure 1, Item 2).
2. Momentarily open then close bottom loading valve (V1) (Figure 1, Item 1) to vent tank pressure.

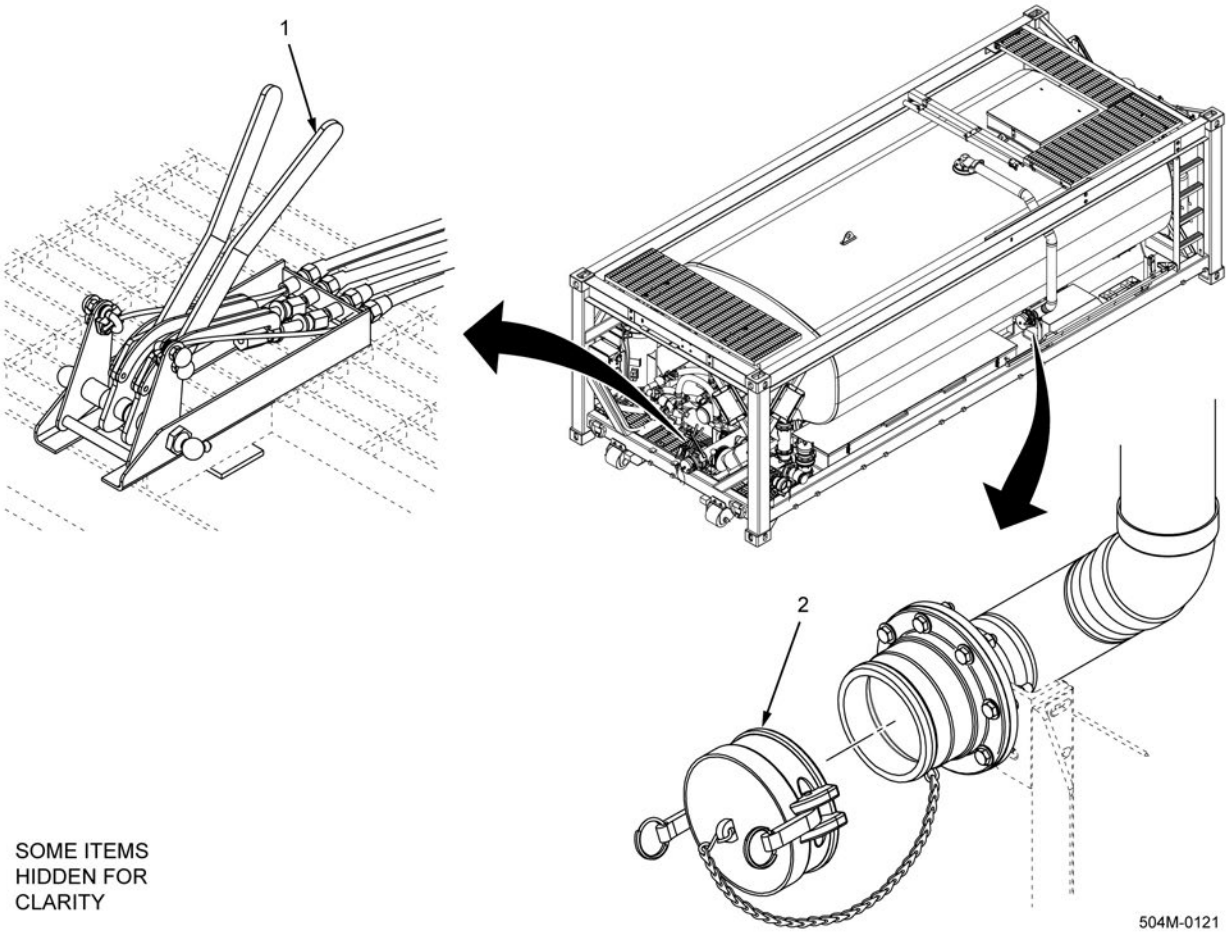


Figure 1. Fuel System Venting.

3. Place drip pan under filter/separator (Figure 2, Item 1) to catch residual fuel.
4. Move handle (Figure 2, Item 10) to open position to drain residual fuel.
5. Remove tube nut (Figure 2, Item 8), ferrule (Figure 2, Item 7), and drain tube (Figure 2, Item 9) from fitting (Figure 2, Item 6).
6. Remove straight fitting (Figure 2, Item 6) from bushing (Figure 2, Item 5).
7. Remove bushing (Figure 2, Item 5) from valve (Figure 2, Item 4).
8. Remove valve (Figure 2, Item 4) and nipple (Figure 2, Item 3) from elbow (Figure 2, Item 2).
9. If nipple (Figure 2, Item 3) remains in elbow (Figure 2, Item 2), remove from elbow (Figure 2, Item 2).
10. Remove elbow (Figure 2, Item 2) from filter/separator weldment (Figure 2, Item 1).
11. Remove drip pan and dispose of fuel IAW unit SOP.

DISASSEMBLY - Continued

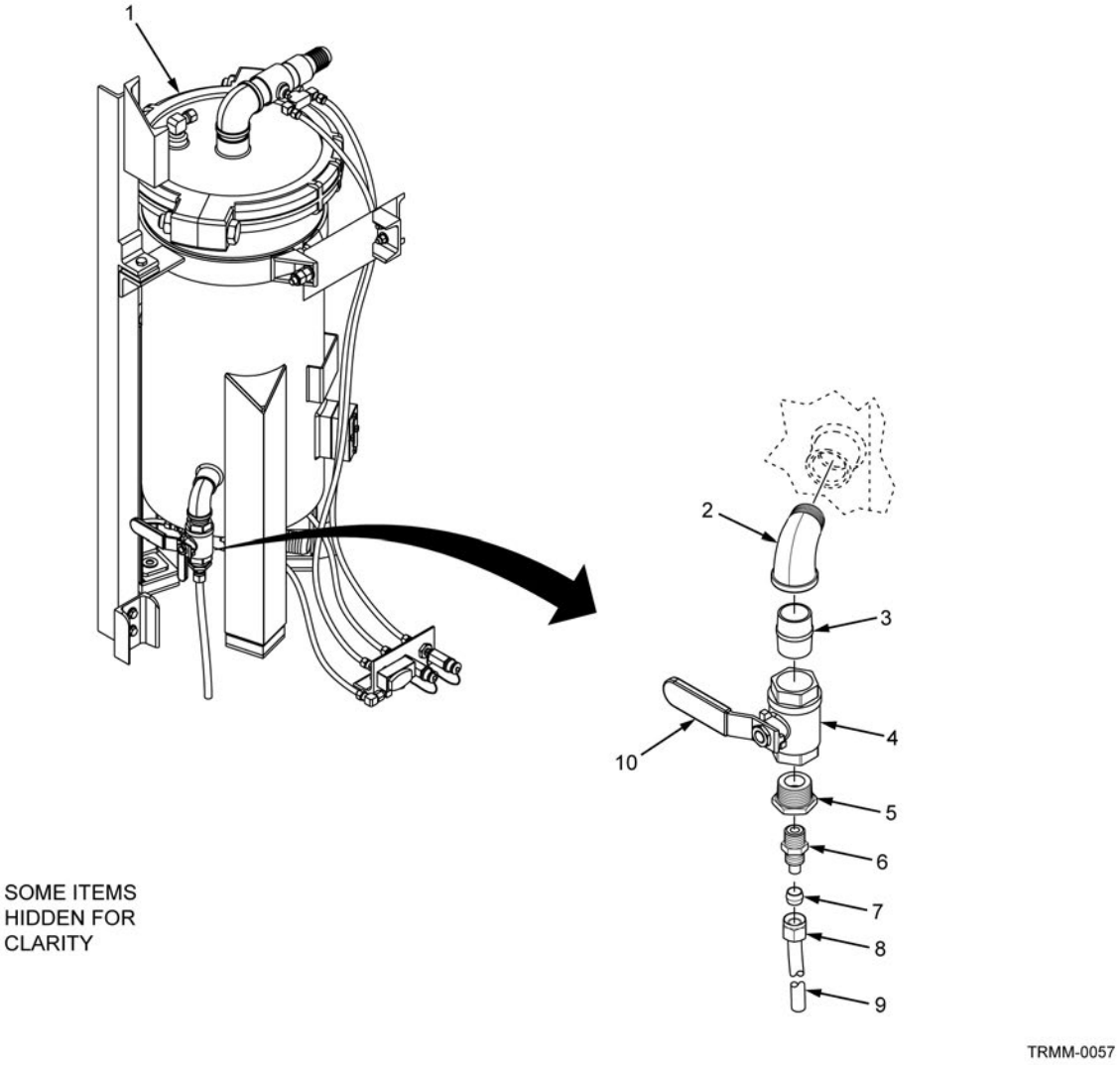


Figure 2. Repairing Water Drain Valve Assembly.

END OF TASK

CLEANING

WARNING

Solvent cleaning compound MIL-PRF-680 Type III is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Keep away from open flames and other sources of ignition. Failure to comply may cause injury to personnel.

1. Clean any residual thread sealant from threads of all components.
2. Clean all metal parts with a cleaning cloth and solvent cleaning compound.
3. Allow parts to dry thoroughly.

END OF TASK

ASSEMBLY

WARNING

Thread sealing compound is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Failure to comply may cause injury to personnel.

CAUTION

Once tightened, do not turn connections counterclockwise. Air leaks will be created and can cause leaks. Damage to equipment could occur.

1. Apply thread sealing compound to all adapter threads except tube nut connections.
2. Install elbow (Figure 2, Item 2) on filter/separator weldment (Figure 2, Item 1).
3. Install nipple (Figure 2, Item 3) on valve (Figure 2, Item 4).
4. Install valve (Figure 2, Item 4) with nipple (Figure 2, Item 3) on elbow (Figure 2, Item 2) then close handle.
5. Install bushing (Figure 2, Item 5) on valve (Figure 2, Item 4).
6. Install straight fitting (Figure 2, Item 6) on bushing (Figure 2, Item 5).
7. Install ferrule (Figure 2, Item 7), tube nut (Figure 2, Item 8), and drain tube (Figure 2, Item 9) on straight fitting (Figure 2, Item 6).
8. Install vapor recovery line dust cap (Figure 3, Item 1).

ASSEMBLY - Continued

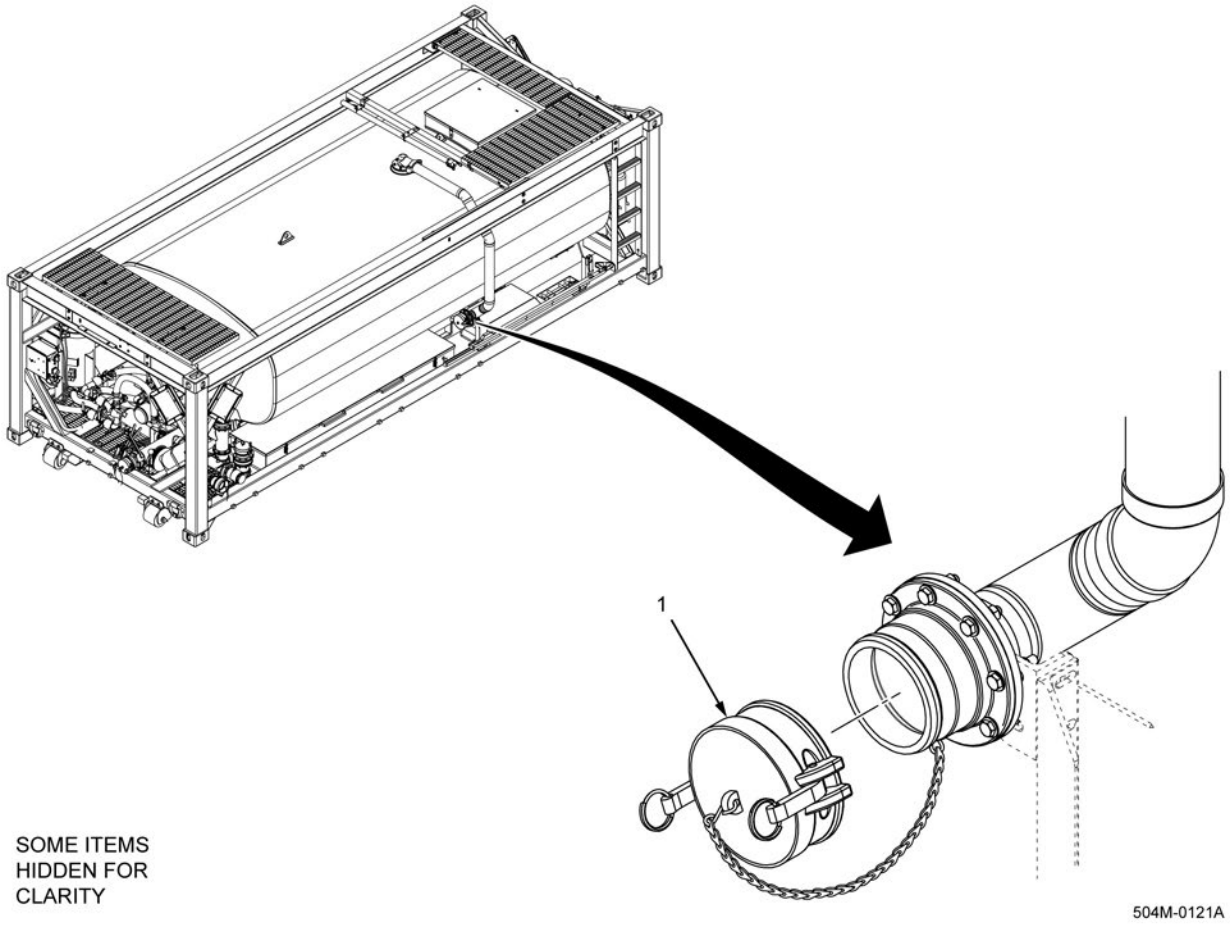


Figure 3. Installing Vapor Recovery Line Dust Cap.

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
FILTER/SEPARATOR SAMPLING PORTS REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposable nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)
- Pan, drip (WP 0217, Table 1, Item 8)

Materials/Parts
- Absorbent material (WP 0216, Table 1, Item 1)
- Cleaning compound, solvent (WP 0216, Table 1, Item 3)
- Thread sealing compound (WP 0216, Table 1, Item 15)
- Fuel Sampler Qty: 2 (WP 0205, Figure 59, Item 63)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer

References
- ATP 4-43

Equipment Condition
- MFS TRM grounded (TM 10-4930-371-10)
- Filter/Separator drained (TM 10-4930-371-10)

Time to Complete
- 2 Hour(s)

REMOVAL

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Failure to comply could result in injury or death to personnel.

NOTE

Note orientation of hardware and components to aid in installation.

1. Remove vapor recovery line dust cap (Figure 1, Item 2).
2. Momentarily open then close bottom loading valve V1 (Figure 1, Item 1) to vent tank pressure.

REMOVAL - Continued

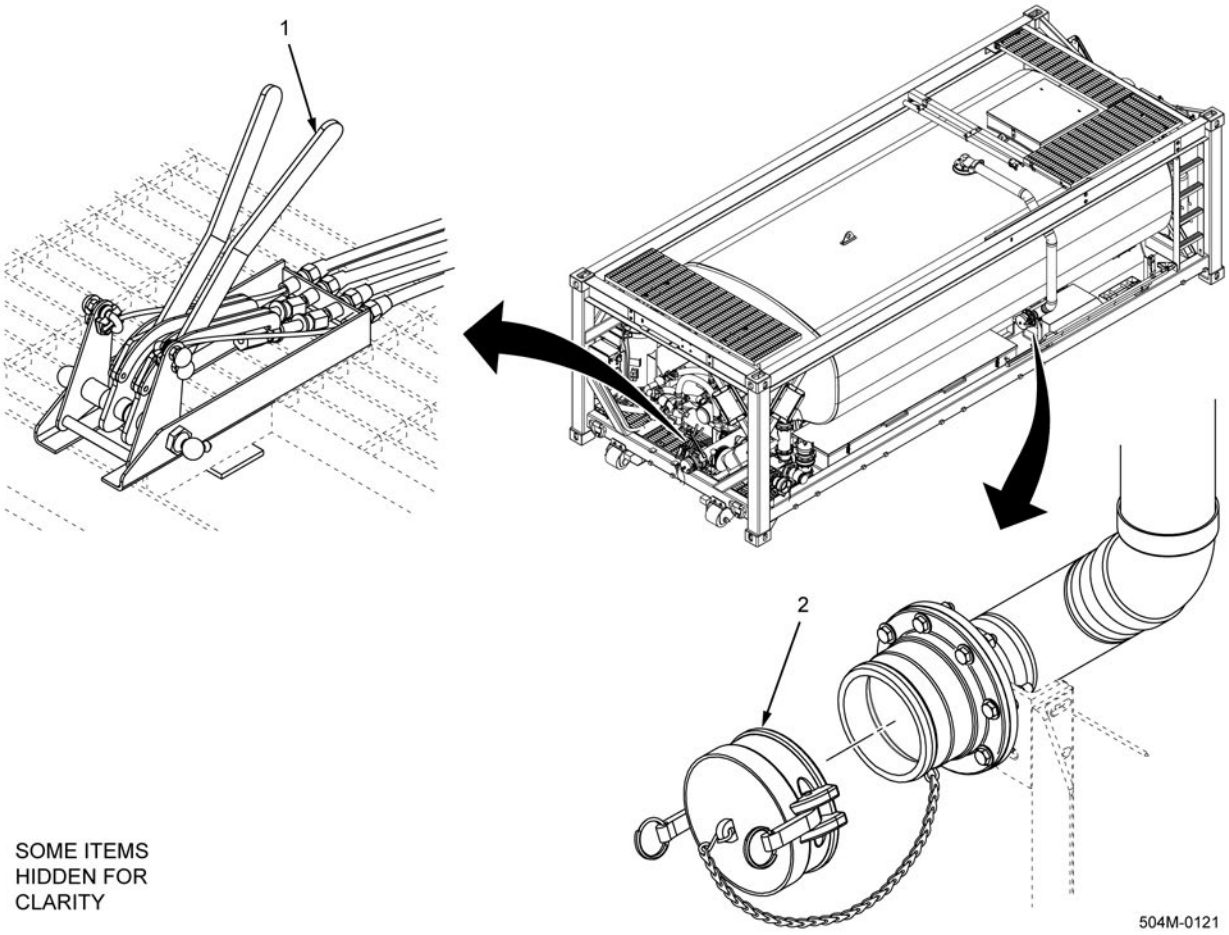


Figure 1. Fuel System Venting.

3. Place drip pan under sampling port to catch residual fuel.

REMOVAL - Continued

NOTE

- Note orientation of hardware and components to aid in installation.
- Removal is the same for inlet and outlet sampling ports.

4. Unscrew tube nut (Figure 2, Item 2) and ferrule (Figure 2, Item 3) from sampling port (Figure 2, Item 10).
5. Remove sampling port (Figure 2, Item 10) from nipple (Figure 2, Item 9).
6. Remove nipple (Figure 2, Item 9) from bulkhead (Figure 2, Item 8).
7. Remove connector (Figure 2, Item 4) from bulkhead (Figure 2, Item 8).
8. Remove nut (Figure 2, Item 5) and internal lockwasher (Figure 2, Item 6) from bulkhead (Figure 2, Item 8).
9. Remove bulkhead (Figure 2, Item 8) from bracket (Figure 2, Item 7).
10. Remove drip pan and dispose of fuel IAW unit SOP.

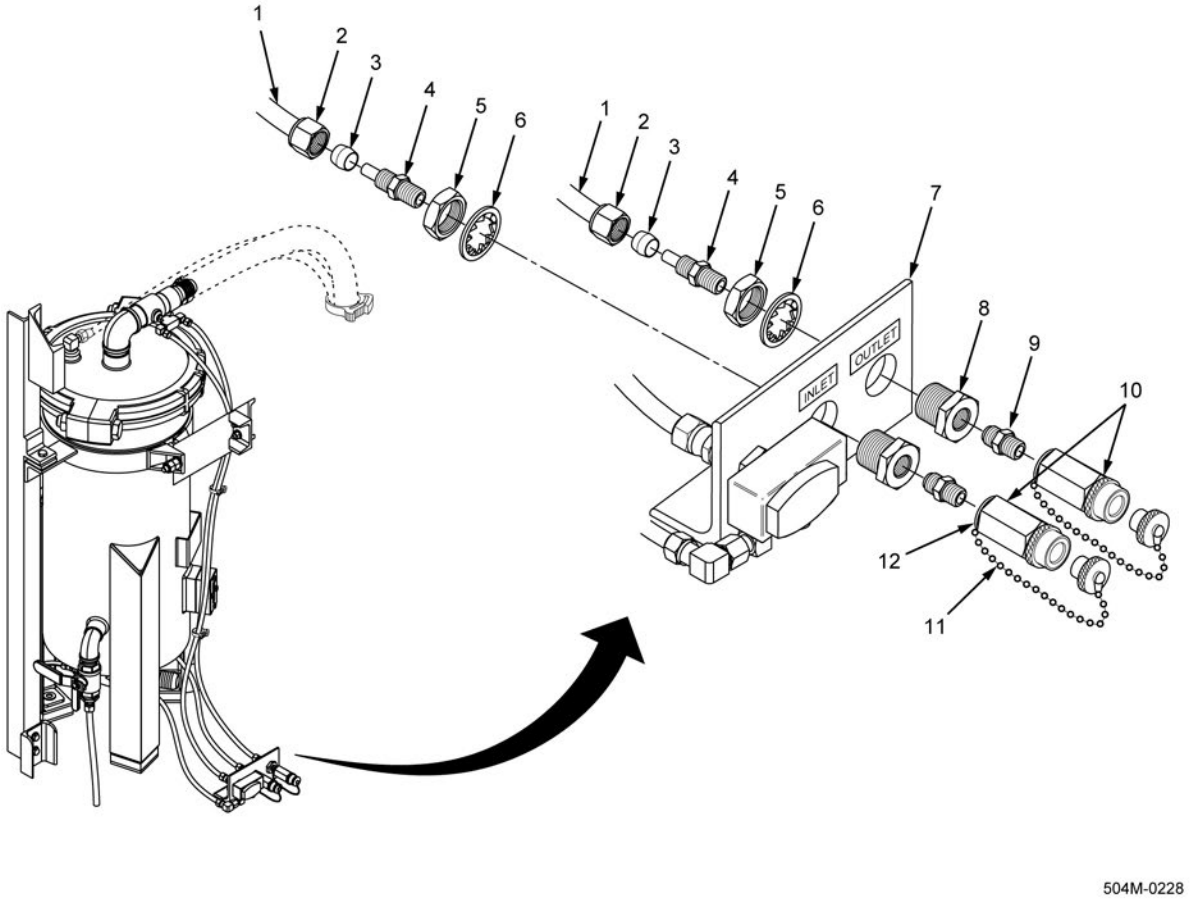


Figure 2. Replacing Sampling Port.

END OF TASK

CLEANING

WARNING

Solvent cleaning compound MIL-PRF-680 Type III is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Keep away from open flames and other sources of ignition. Failure to comply may cause injury to personnel.

1. Clean any residual thread sealant from threads of all components.
2. Clean all metal parts with a cleaning cloth and solvent cleaning compound.
3. Allow parts to dry thoroughly.

END OF TASK

INSTALLATION

WARNING

Thread sealing compound is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Failure to comply may cause injury to personnel.

1. Apply thread sealing compound to threads of nipple (Figure 2, Item 9) and bulkhead connection of connector (Figure 2, Item 4).
2. Install bulkhead (Figure 2, Item 8) into bracket (Figure 2, Item 7) with internal lockwasher (Figure 2, Item 6) and nut (Figure 2, Item 5).
3. Install connector (Figure 2, Item 4) on bulkhead (Figure 2, Item 8).
4. Install nipple (Figure 2, Item 9) on bulkhead (Figure 2, Item 8).
5. Place ball chain (Figure 2, Item 11) split ring (Figure 2, Item 12) around nipple (Figure 2, Item 9) and install sampling port (Figure 2, Item 10) on nipple (Figure 2, Item 9).
6. Install product line (Figure 2, Item 1) with new tube nut (Figure 2, Item 3) and ferrule (Figure 2, Item 2) to connector (Figure 2, Item 4).
7. Install vapor recovery line dust cap (Figure 3, Item 1).

INSTALLATION - Continued

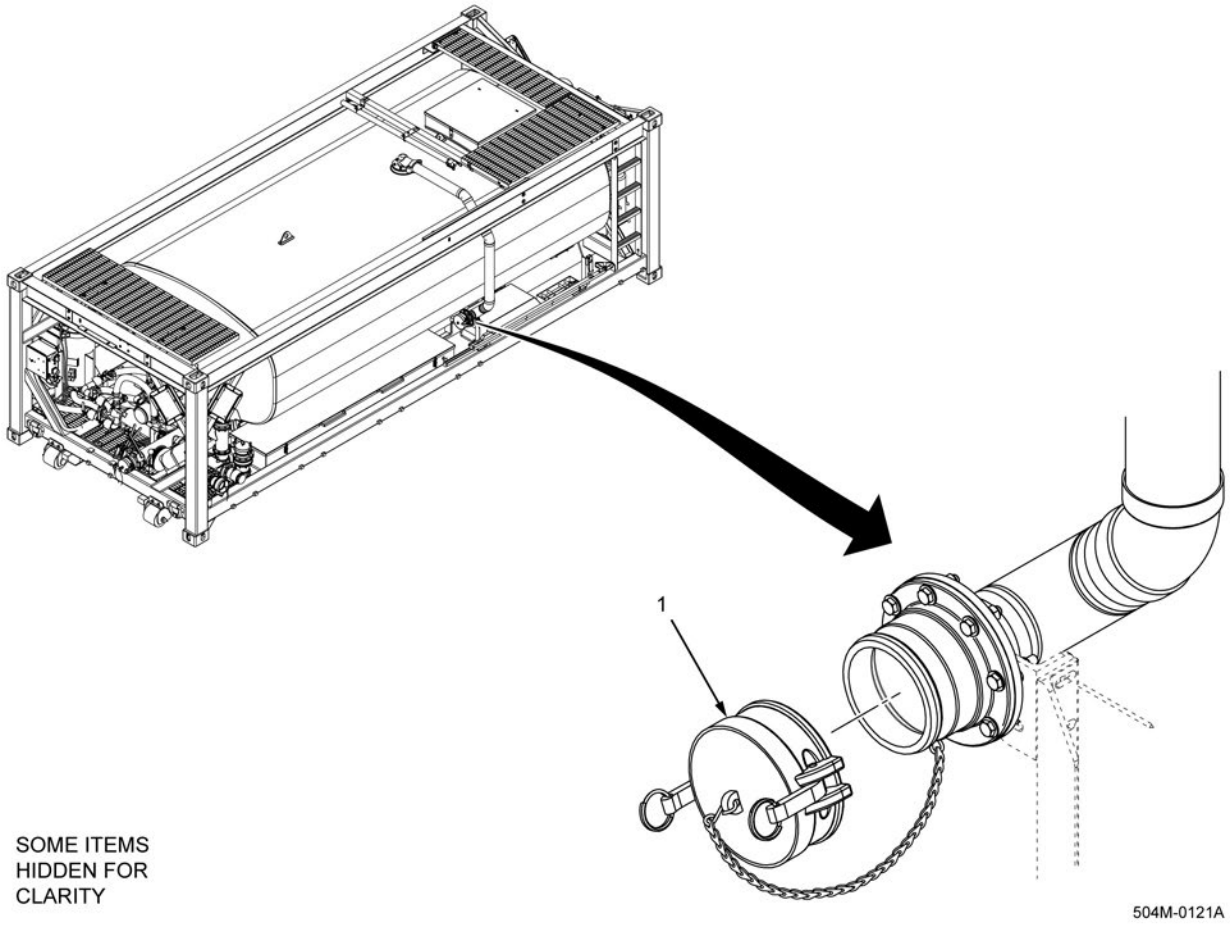


Figure 3. Installing Vapor Recovery Line Dust Cap.

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
FILTER/SEPARATOR DIFFERENTIAL PRESSURE GAUGE REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposable nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)
- Pan, drip (WP 0217, Table 1, Item 8)
- Vise, machinist's (WP 0217, Table 1, Item 14)

Materials/Parts
- Absorbent material (WP 0216, Table 1, Item 1)
- Cleaning compound, solvent (WP 0216, Table 1, Item 3)
- Cloth, cleaning (WP 0216, Table 1, Item 4)
- Thread sealing compound (WP 0216, Table 1, Item 15)
- Differential Pressure Gauge (WP 0205, Figure 59, Item 64)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer

References
- ATP 4-43

Equipment Condition
- MFS TRM grounded (TM 10-4930-371-10)
- Filter/Separator drained (TM 10-4930-371-10)

Time to Complete
- 1 Hour(s)

REMOVAL

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Failure to comply could result in injury or death to personnel.

NOTE

Note orientation of hardware and components to aid in installation.

1. Remove vapor recovery line dust cap (Figure 1, Item 2).

REMOVAL - Continued

2. Momentarily open then close bottom loading valve (V1) (Figure 1, Item 1) to vent tank pressure.

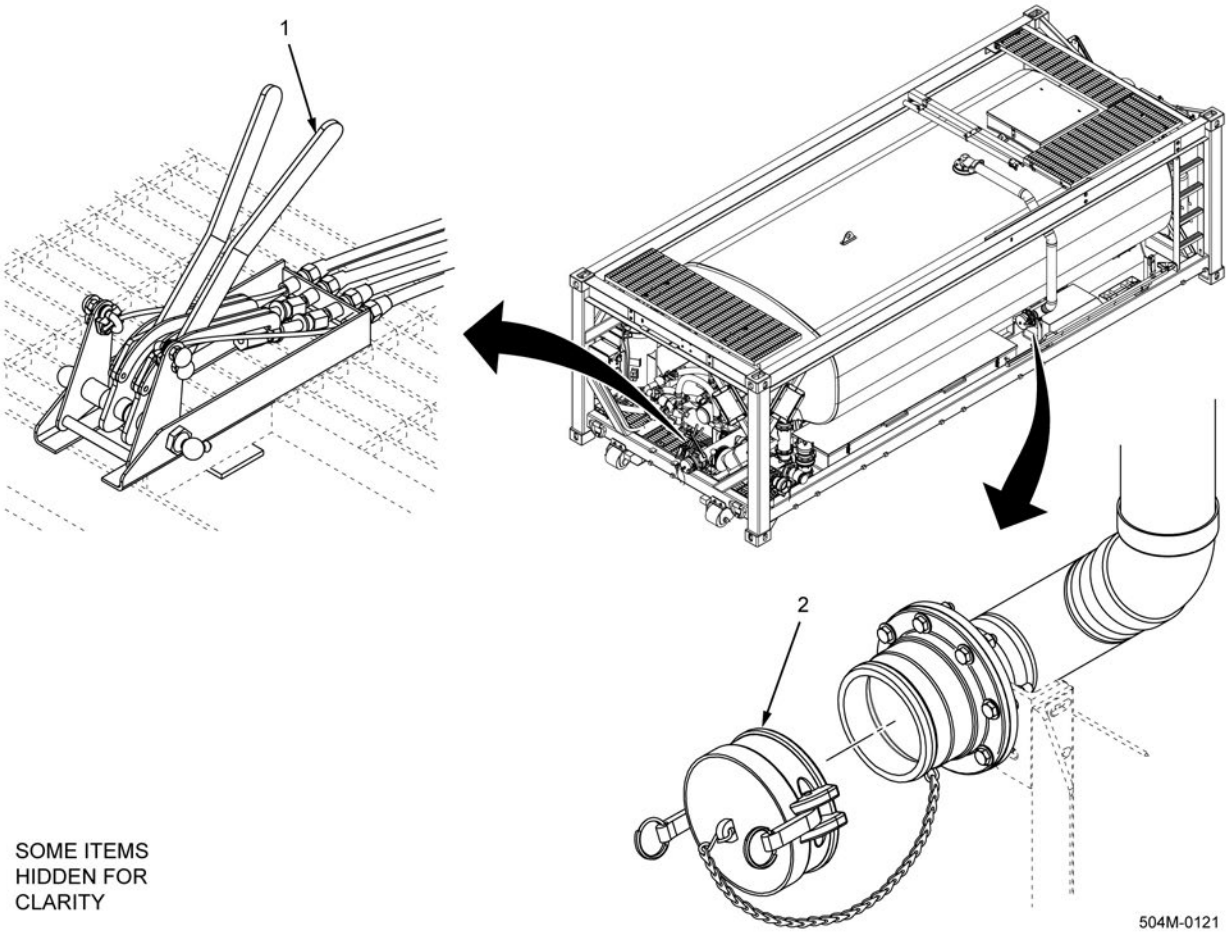


Figure 1. Fuel System Venting.

3. Place drip pan under filter/separator to catch residual fuel.
4. Unscrew tube nut (Figure 2, Item 13) and disconnect tube (Figure 2, Item 14) from elbow (Figure 2, Item 11).
5. Unscrew tube nut (Figure 2, Item 2) and disconnect tube (Figure 2, Item 1) from bulkhead fitting (Figure 2, Item 17).
6. Remove nut (Figure 2, Item 5) and internal lock washer (Figure 2, Item 6) from bulkhead fitting (Figure 2, Item 17).
7. Remove differential pressure gauge (Figure 2, Item 7) and attached fittings from bracket (Figure 2, Item 18).
8. Remove elbow (Figure 2, Item 11) from adapter (Figure 2, Item 10).
9. Remove adapter (Figure 2, Item 10) from elbow (Figure 2, Item 9).
10. Remove elbow (Figure 2, Item 9) from differential pressure gauge (Figure 2, Item 7).
11. Remove connector (Figure 2, Item 4) from bulkhead fitting (Figure 2, Item 17).
12. Remove bulkhead fitting (Figure 2, Item 17) from nipple (Figure 2, Item 16).

REMOVAL - Continued

13. Remove nipple (Figure 2, Item 16) from adapter (Figure 2, Item 15).
14. Remove adapter (Figure 2, Item 15) from elbow (Figure 2, Item 8).
15. Remove elbow (Figure 2, Item 8) from differential pressure gauge (Figure 2, Item 7).
16. Remove drip pan and dispose of fuel IAW unit SOP.

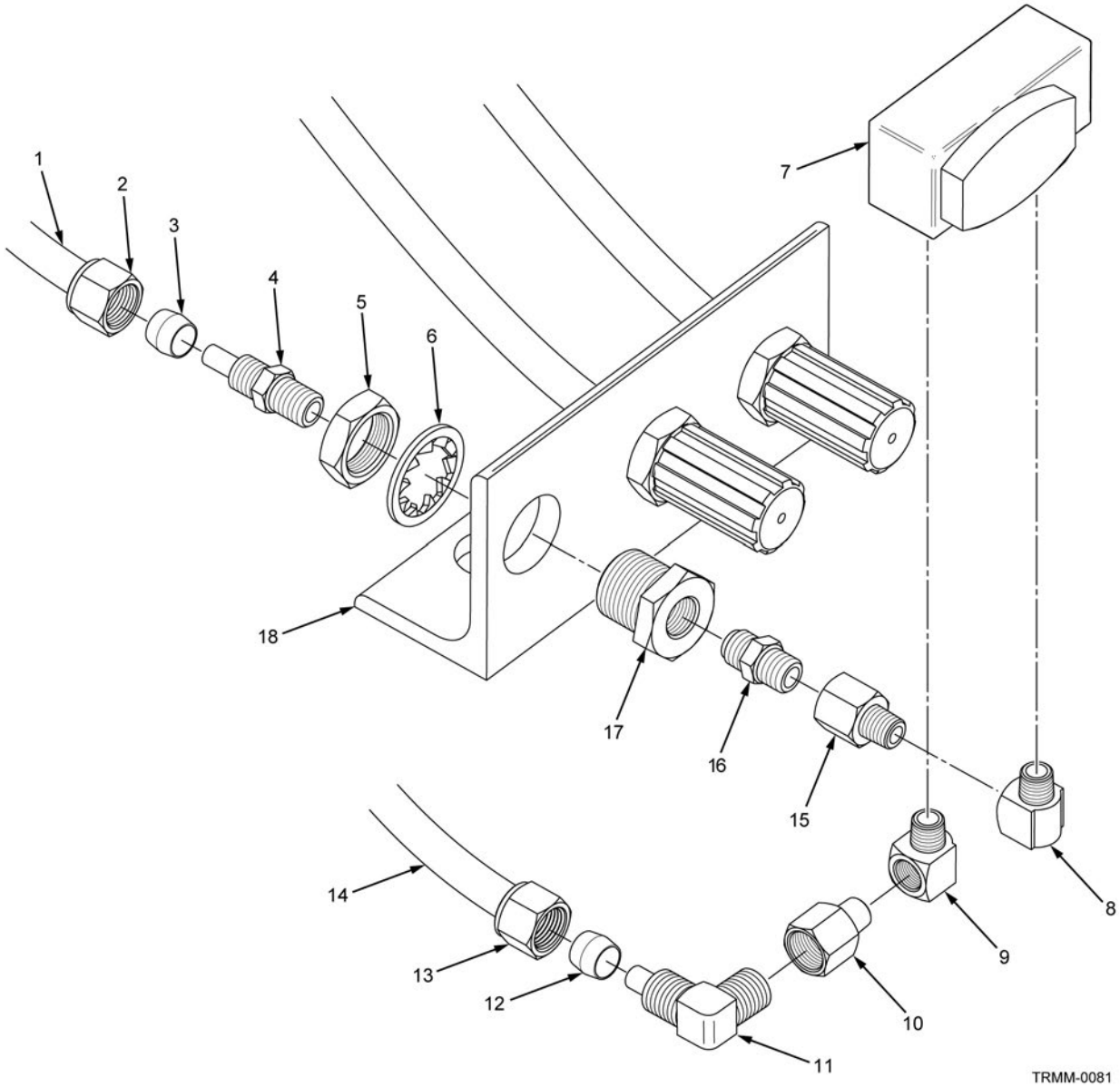


Figure 2. Differential Pressure Gauge.

END OF TASK

CLEANING

WARNING

Solvent cleaning compound MIL-PRF-680 Type III is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Keep away from open flames and other sources of ignition. Failure to comply may cause injury to personnel.

1. Clean any residual thread sealant from threads of all components.
2. Clean all metal parts with a cleaning cloth and solvent cleaning compound.
3. Allow parts to dry thoroughly.

END OF TASK

INSTALLATION

WARNING

Thread sealing compound is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Failure to comply may cause injury to personnel.

1. Apply thread sealing compound to all threads except bulkhead fitting (Figure 2, Item 17), tube side of elbow (Figure 2, Item 11), and tube side of connector (Figure 2, Item 4).
2. Install elbow (Figure 2, Item 9) in differential pressure gauge (Figure 2, Item 7).
3. Install adapter (Figure 2, Item 10) on elbow (Figure 2, Item 9).
4. Install elbow (Figure 2, Item 11) into adapter (Figure 2, Item 10).
5. Install elbow (Figure 2, Item 8) into differential pressure gauge (Figure 2, Item 7).
6. Install adapter (Figure 2, Item 15) into elbow (Figure 2, Item 8).
7. Install nipple (Figure 2, Item 16) into adapter (Figure 2, Item 15).
8. Install bulkhead fitting (Figure 2, Item 17) onto nipple (Figure 2, Item 16).
9. Install connector (Figure 2, Item 4) into bulkhead fitting (Figure 2, Item 17).
10. Install bulkhead fitting (Figure 2, Item 17) through bracket (Figure 2, Item 18) and secure with internal lock washer (Figure 2, Item 6) and nut (Figure 2, Item 5).
11. Connect tube (Figure 2, Item 1) to fitting (Figure 2, Item 4) with tube nut (Figure 2, Item 2), and if necessary, ferrule (Figure 2, Item 3). Tighten tube nut (Figure 2, Item 2).
12. Connect tube (Figure 2, Item 14) to fitting (Figure 2, Item 11) with tube nut (Figure 2, Item 13) and if necessary, ferrule (Figure 2, Item 12). Tighten tube nut (Figure 2, Item 13).
13. Install vapor recovery line dust cap (Figure 3, Item 1).

INSTALLATION - Continued

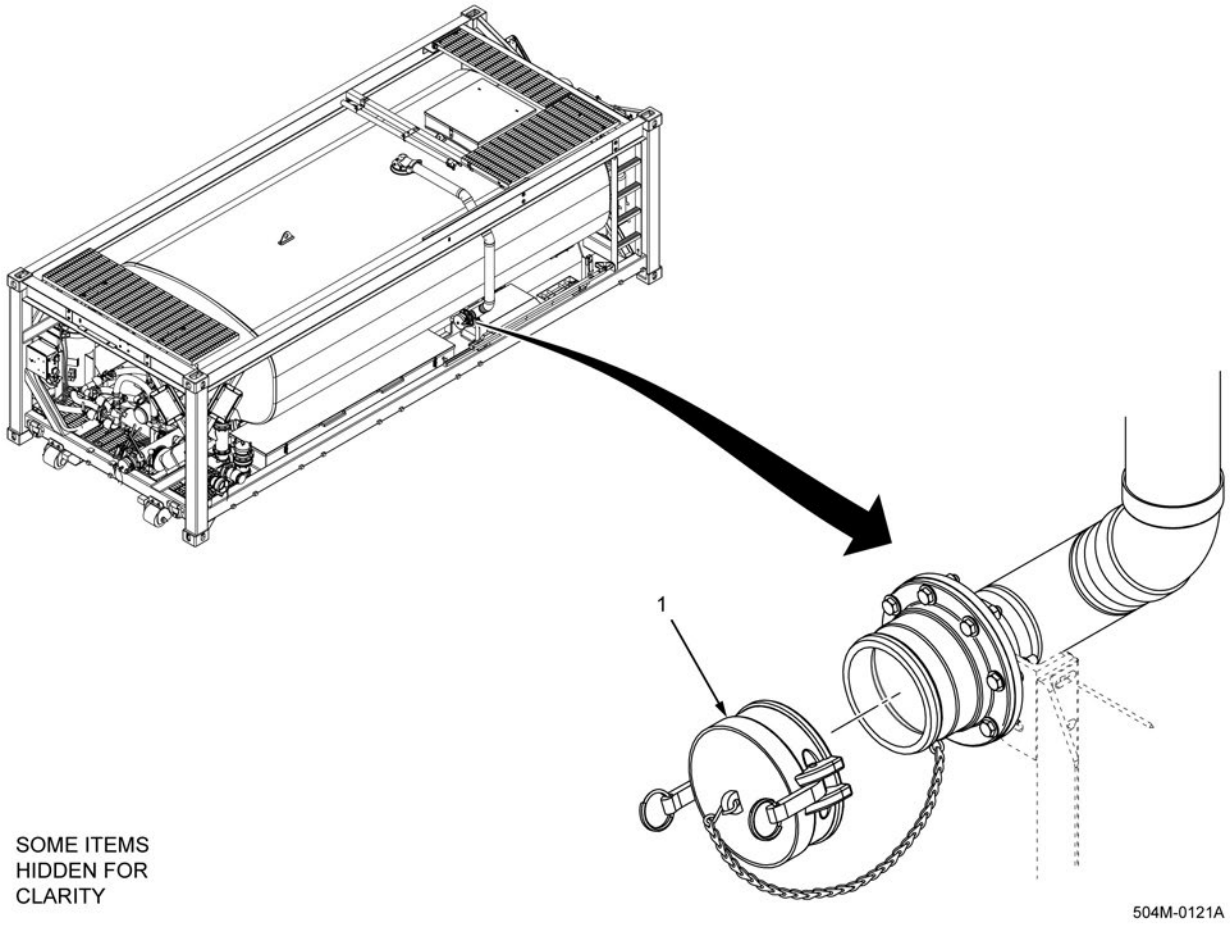


Figure 3. Installing Vapor Recovery Line Dust Cap.

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
FILTER/SEPARATOR SIGHT GAUGE REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposable nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)
- Pan, drip (WP 0217, Table 1, Item 8)

Materials/Parts
- Absorbent material (WP 0216, Table 1, Item 1)
- Cloth, cleaning (WP 0216, Table 1, Item 4)
- Cleaning compound, solvent (WP 0216, Table 1, Item 3)
- Ball, Fuel Level Float (WP 0205, Figure 59, Item 57)
- Gasket, Gauge (WP 0205, Figure 59, Item 58)
- Screw Cap, Hexagon Head Qty: 4 (WP 0205, Figure 59, Item 54)

Materials/Parts (cont.)
- Gauge Body W/ Scribe Line (WP 0205, Figure 59, Item 56)
- Gauge Guard (WP 0205, Figure 59, Item 55)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer

References
- ATP 4-43

Equipment Condition
- MFS TRM grounded (TM 10-4930-371-10)
- Filter/Separator drained (TM 10-4930-371-10)

Time to Complete
- 0.5 Hour(s)

REMOVAL

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Failure to comply could result in injury or death to personnel.

1. Remove vapor recovery line dust cap (Figure 1, Item 2).
2. Momentarily open then close bottom loading valve (V1) (Figure 1, Item 1) to vent tank pressure.

REMOVAL - Continued

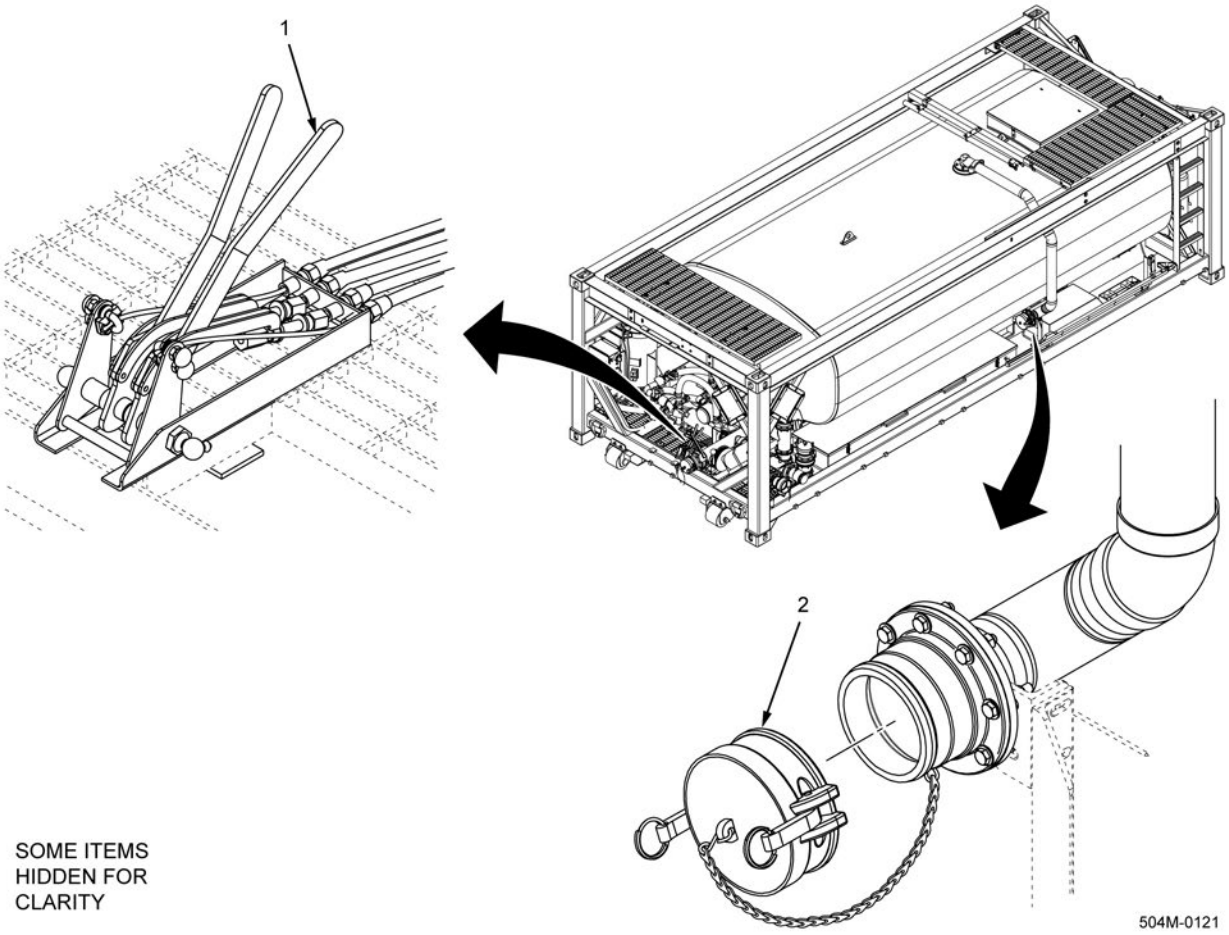


Figure 1. Fuel System Venting.

3. Place drip pan under sight gauge to catch residual fuel.

NOTE

Float ball will be loose and may fall out when sight gauge is removed.

4. Remove four screws (Figure 2, Item 4) and remove gauge guard (Figure 2, Item 3), gauge body (Figure 2, Item 2), gasket (Figure 2, Item 1) and float ball (Figure 2, Item 5). Discard gasket.
5. Remove drip pan and dispose of fuel IAW unit SOP.

END OF TASK

CLEANING

WARNING

Solvent cleaning compound MIL-PRF-680 Type III is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Keep away from open flames and other sources of ignition. Failure to comply may cause injury to personnel.

1. Clean all metal parts with a cleaning cloth and solvent cleaning compound.
2. Allow parts to dry thoroughly.

END OF TASK

INSTALLATION

1. Install float ball (Figure 2, Item 5) in back of gauge body (Figure 2, Item 2).
2. Ensuring that float ball (Figure 2, Item 5) does not fall out, install new gasket (Figure 2, Item 1), gauge body (Figure 2, Item 2), and gauge guard (Figure 2, Item 3) and secure with four screws (Figure 2, Item 4).

INSTALLATION - Continued

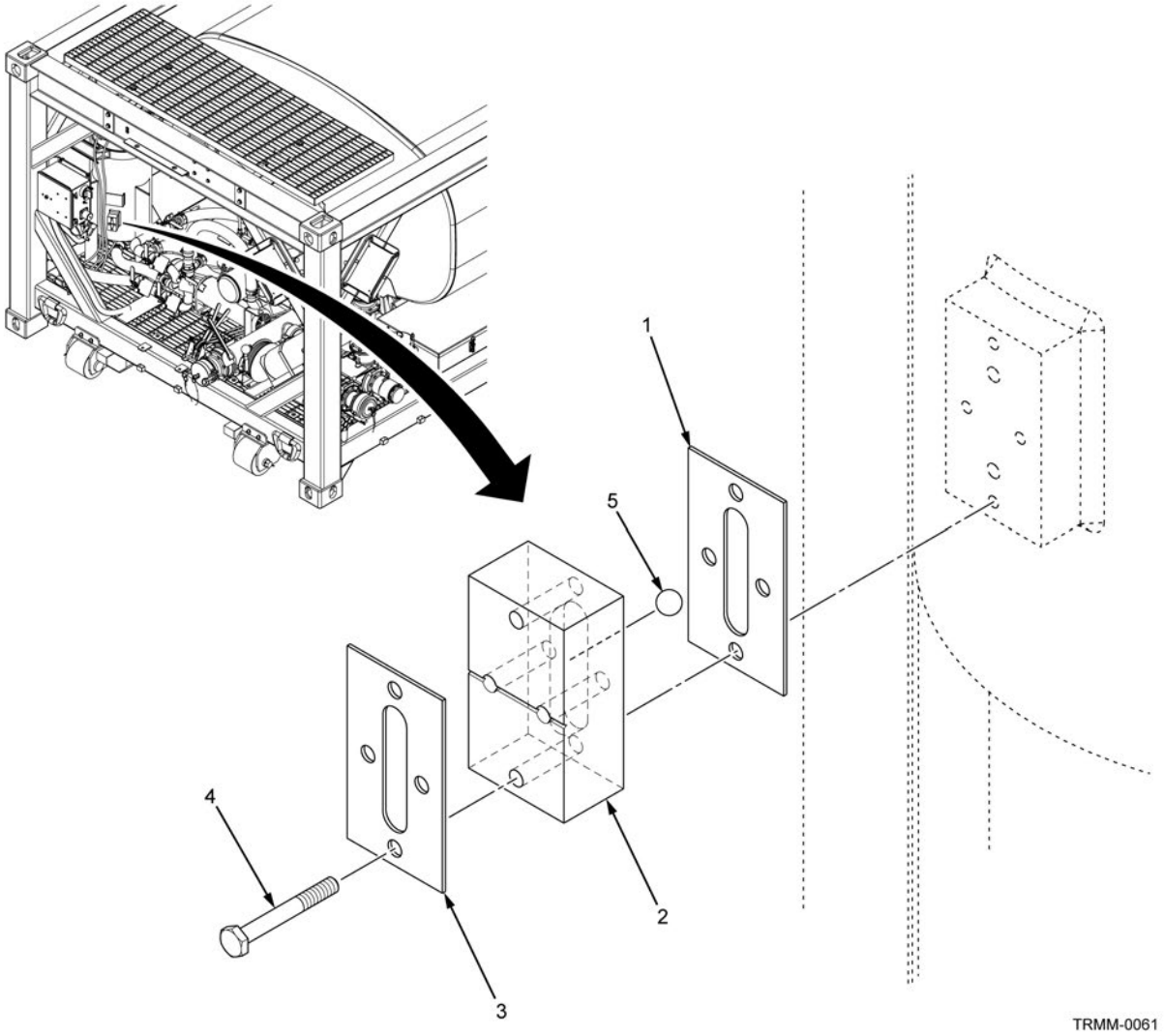


Figure 2. Sight Gauge.

3. Install dust cap on vapor recovery line (Figure 3, Item 1).

INSTALLATION - Continued

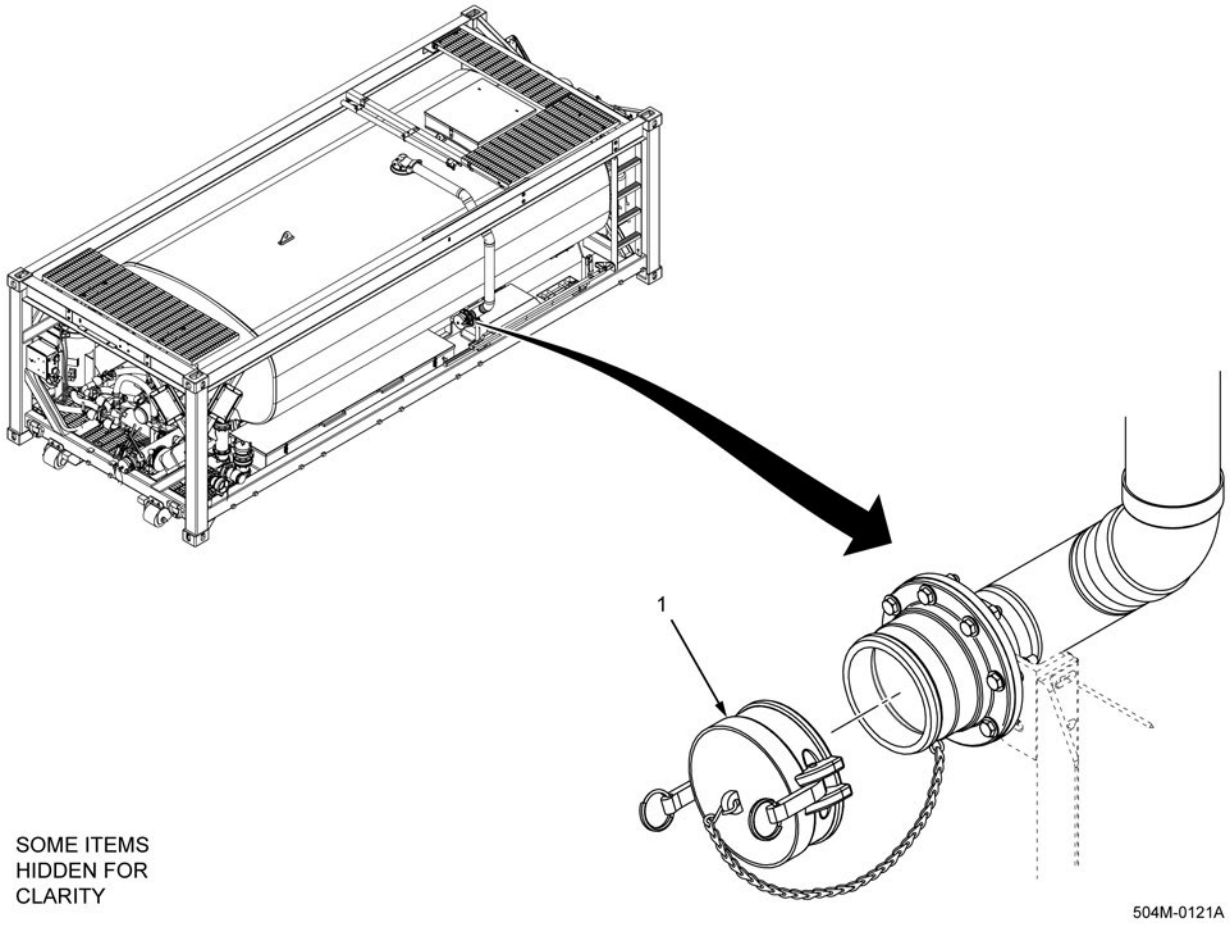


Figure 3. Installing Vapor Recovery Line Dust Cap.

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
FILTER/SEPARATOR PIPING REPAIR

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Gloves, disposable nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)
- Pan, drip (WP 0217, Table 1, Item 8)
- Wrench, internal pipe (WP 0217, Table 1, Item 18)
- Wrench, pipe, 18 inch (WP 0217, Table 1, Item 19)

Materials/Parts
- Absorbent material (WP 0216, Table 1, Item 1)
- Cloth, cleaning (WP 0216, Table 1, Item 4)
- Cleaning compound, solvent (WP 0216, Table 1, Item 3)
- Thread sealing compound (WP 0216, Table 1, Item 15)
- Wire brush (WP 0217, Table 1, Item 15)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer (2)

References
- ATP 4-43
- TM 10-4930-371-10

Equipment Condition
- MFS TRM grounded (TM 10-4930-371-10)
- Filter/Separator drained (TM 10-4930-371-10)

Time to Complete
- 6 Hour(s)

OUTLET PIPING DISASSEMBLY

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Thread sealing compound is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Failure to comply may cause injury to personnel.
- Failure to comply could result in injury or death to personnel.

NOTE

Note orientation of hardware and components to aid in installation.

1. Remove vapor recovery line dust cap (Figure 1, Item 2).
2. Momentarily open then close bottom loading valve (V1) (Figure 1, Item 1) to vent tank pressure.

OUTLET PIPING DISASSEMBLY - Continued

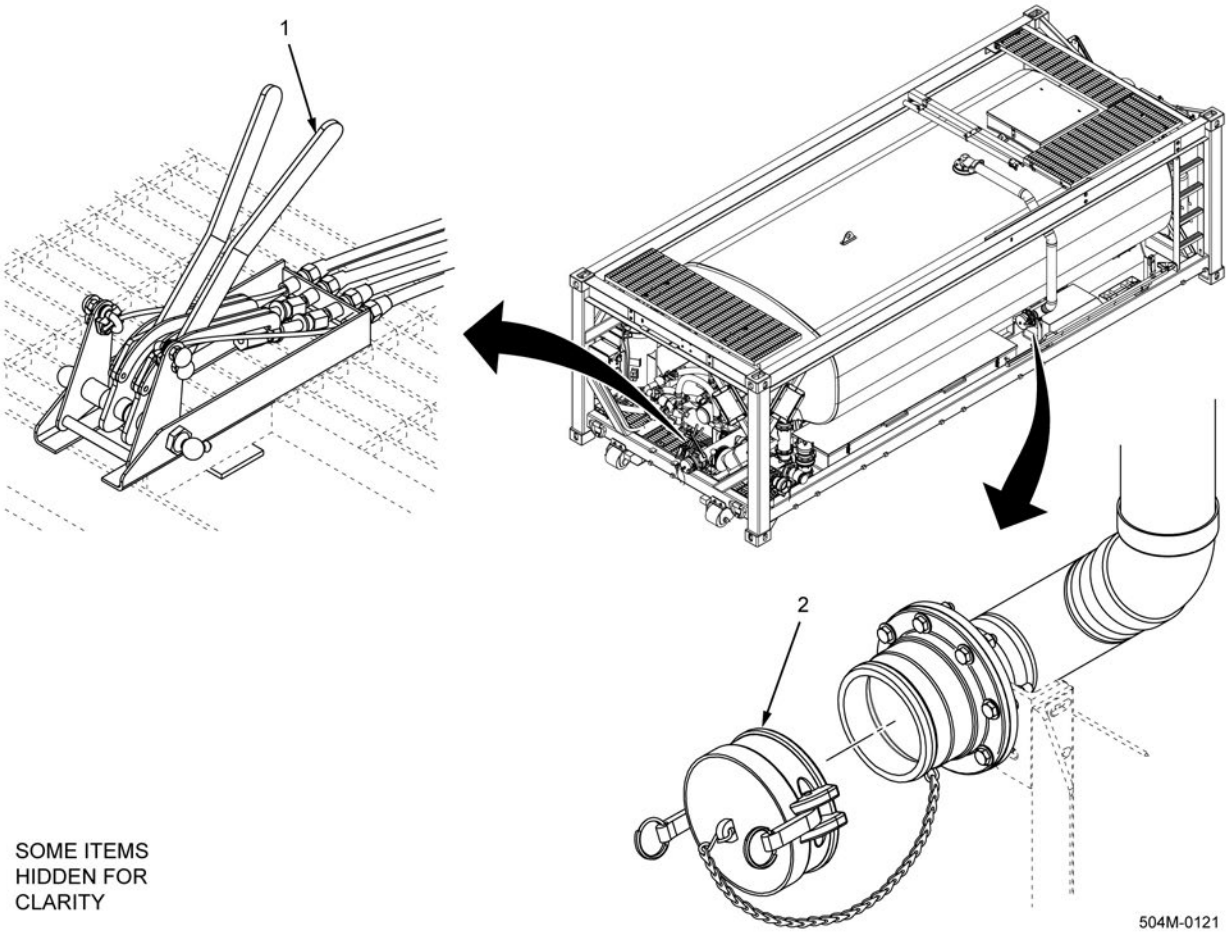


Figure 1. Fuel System Venting.

3. Place drip pan under filter/separator piping to be removed.
4. Close all valves.
5. Remove one snap grip clip (Figure 2, Item 5).
6. Unscrew tube nut (Figure 2, Item 11) and remove tube (Figure 2, Item 12) from elbow (Figure 2, Item 8).

OUTLET PIPING DISASSEMBLY - Continued

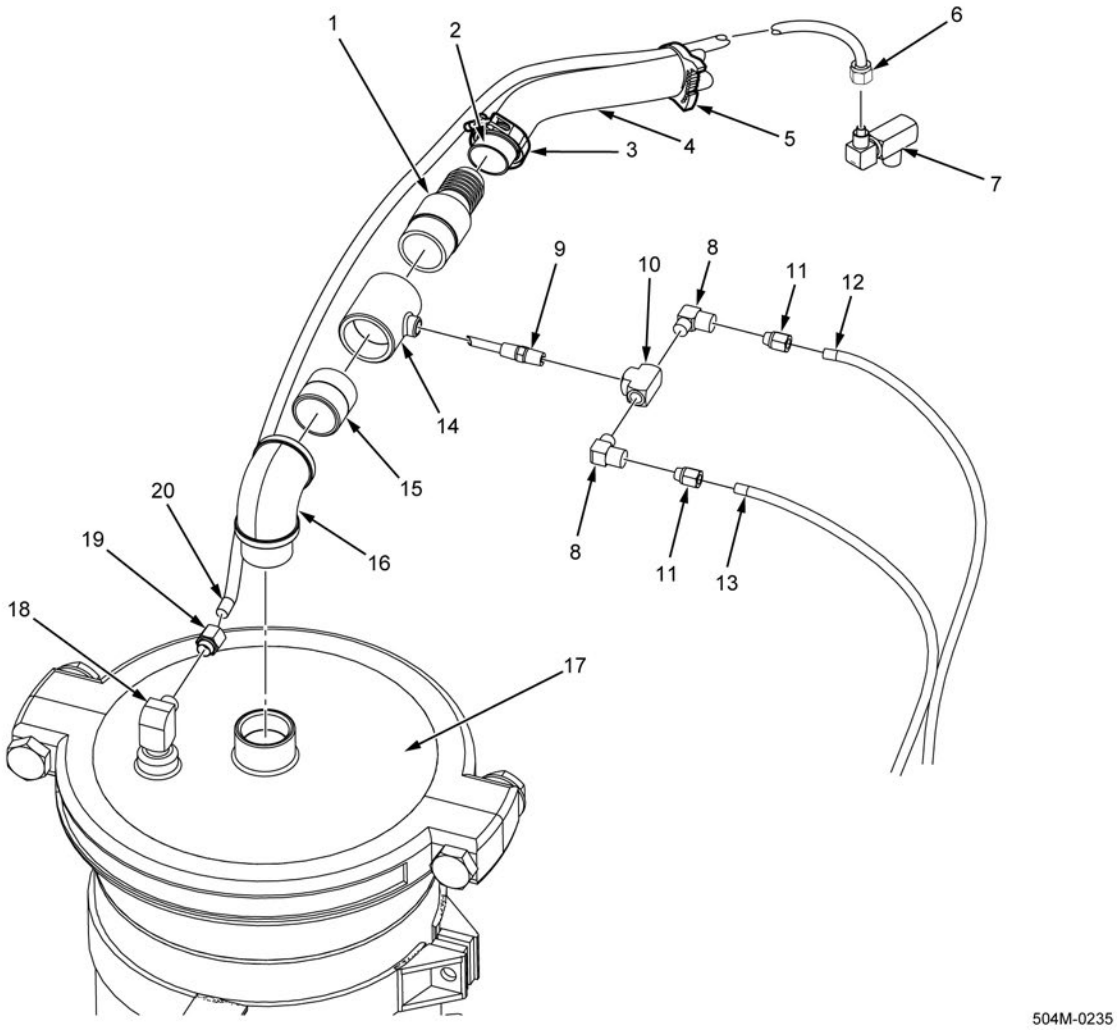


Figure 2. Filter/Separator Outlet Piping.

7. Unscrew tube nut (Figure 2, Item 11) and remove tube (Figure 2, Item 13) from elbow (Figure 2, Item 8).
8. Unscrew tube nut (Figure 2, Item 19) and remove tube (Figure 2, Item 20) from elbow (Figure 2, Item 18) on lid.
9. Remove hose clamp (Figure 2, Item 3) and flexible hose (Figure 2, Item 2) from hose barb (Figure 2, Item 1).
10. Unscrew tube nut (Figure 2, Item 6) and remove tube (Figure 2, Item 20) from flow meter inlet piping (Figure 2, Item 7).
11. Mark orientation of coupling (Figure 2, Item 14) and outlet sampling probe (Figure 2, Item 9).
12. Remove two elbows (Figure 2, Item 8) from tee (Figure 2, Item 10).
13. Remove tee (Figure 2, Item 10) from outlet sampling probe (Figure 2, Item 9).
14. Remove outlet sampling probe (Figure 2, Item 9) from coupling (Figure 2, Item 14).
15. Remove elbow (Figure 2, Item 18) from lid (Figure 2, Item 17).

OUTLET PIPING DISASSEMBLY - Continued

16. Remove hose barb (Figure 2, Item 1) from coupling (Figure 2, Item 14).
17. Remove coupling (Figure 2, Item 14) from nipple (Figure 2, Item 15).
18. Remove nipple (Figure 2, Item 15).
19. Remove elbow (Figure 2, Item 16) from lid (Figure 2, Item 17).
20. Remove drip pan and dispose of fuel IAW unit SOP.

END OF TASK

CLEANING

WARNING

- Solvent cleaning compound MIL-PRF-680 Type III is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Keep away from open flames and other sources of ignition. Failure to comply may cause injury to personnel.
- Thread sealing compound is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Failure to comply may cause injury to personnel.

1. Clean any residual thread sealant from threads of all components.
2. Clean all metal parts with a cleaning cloth and solvent cleaning compound.
3. Allow parts to dry thoroughly.

END OF TASK

OUTLET PIPING ASSEMBLY

1. Apply thread sealing compound to all threaded fittings except where tube nut and ferrules are connected.
2. Install elbow (Figure 2, Item 16) on lid (Figure 2, Item 17).
3. Install nipple (Figure 2, Item 15) on elbow (Figure 2, Item 16).
4. Loosely install coupling (Figure 2, Item 14) on nipple (Figure 2, Item 15).
5. Install hose barb (Figure 2, Item 1) on coupling (Figure 2, Item 14) and tighten hose barb (Figure 2, Item 1) and coupling (Figure 2, Item 14).
6. Install outlet sampling probe (Figure 2, Item 9) into coupling (Figure 2, Item 14) as noted during removal.

NOTE

Ensure outlet sampling probe does not move during tee installation.

7. Install tee (Figure 2, Item 10) on sampling probe (Figure 2, Item 9).

OUTLET PIPING ASSEMBLY - Continued

8. Install two elbows (Figure 2, Item 8) on tee (Figure 2, Item 10).
9. Install tube nut (Figure 2, Item 11) and tube (Figure 2, Item 12) on elbow (Figure 2, Item 8).
10. Install tube nut (Figure 2, Item 11) and tube (Figure 2, Item 13) on elbow (Figure 2, Item 8).
11. Install elbow (Figure 2, Item 18) on lid (Figure 2, Item 17).
12. Install tube nut (Figure 2, Item 19) and tube (Figure 2, Item 20) on elbow (Figure 2, Item 18).
13. Install tube nut (Figure 2, Item 6) and tube (Figure 2, Item 20) on flow meter inlet piping (Figure 2, Item 7).
14. Install flexible hose (Figure 2, Item 2) with hose clamp (Figure 2, Item 3) on hose barb (Figure 2, Item 1).
15. Install snap grip clip (Figure 2, Item 5).
16. Install vapor recovery line dust cap (Figure 3, Item 1).

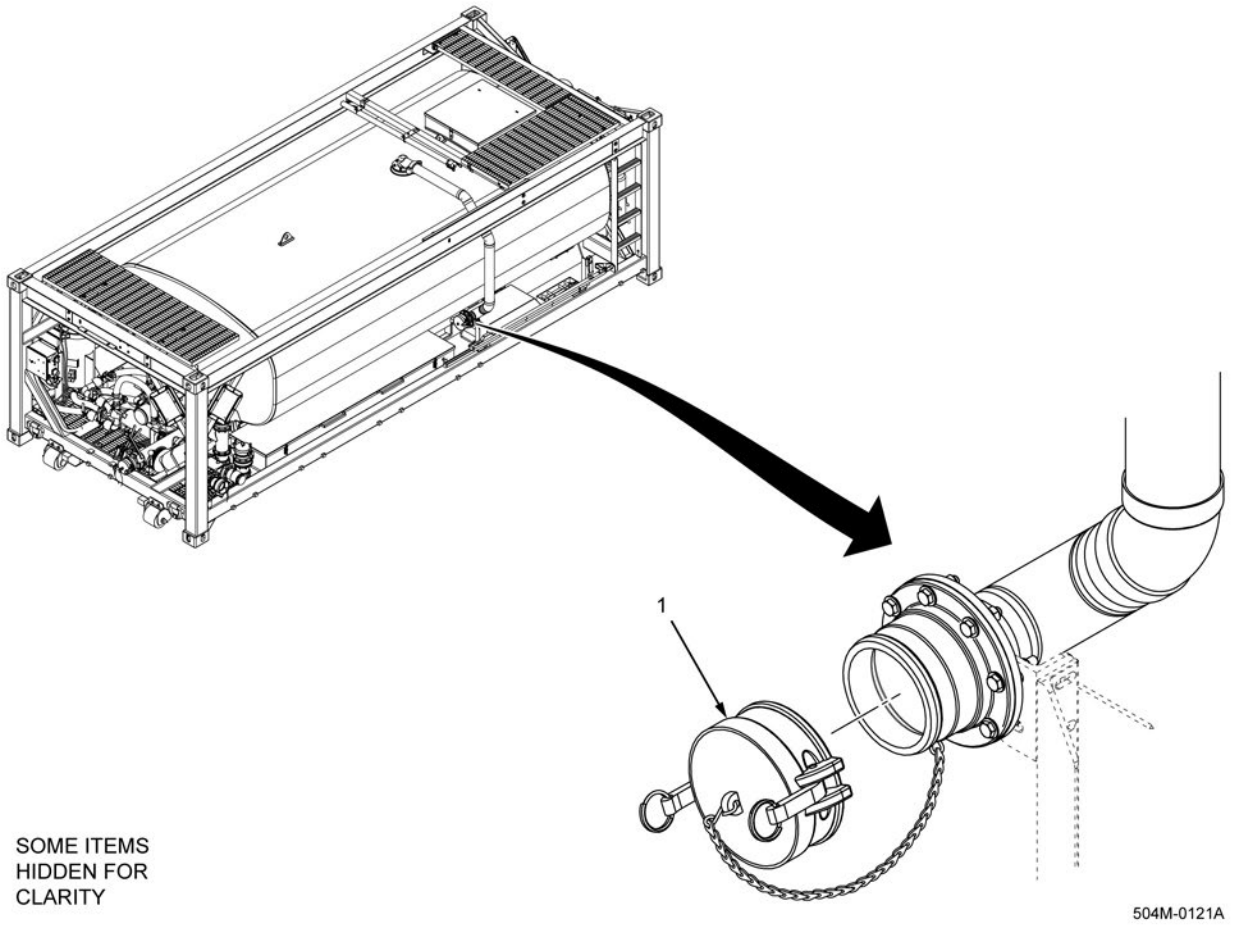


Figure 3. Installing Vapor Recovery Line Dust Cap.

END OF TASK

INLET PIPING DISASSEMBLY

NOTE

Note orientation of hardware and components to aid in installation.

1. Remove vapor recovery line dust cap (Figure 4, Item 2).
2. Momentarily open then close bottom loading valve (V1) (Figure 4, Item 1) to vent tank pressure.

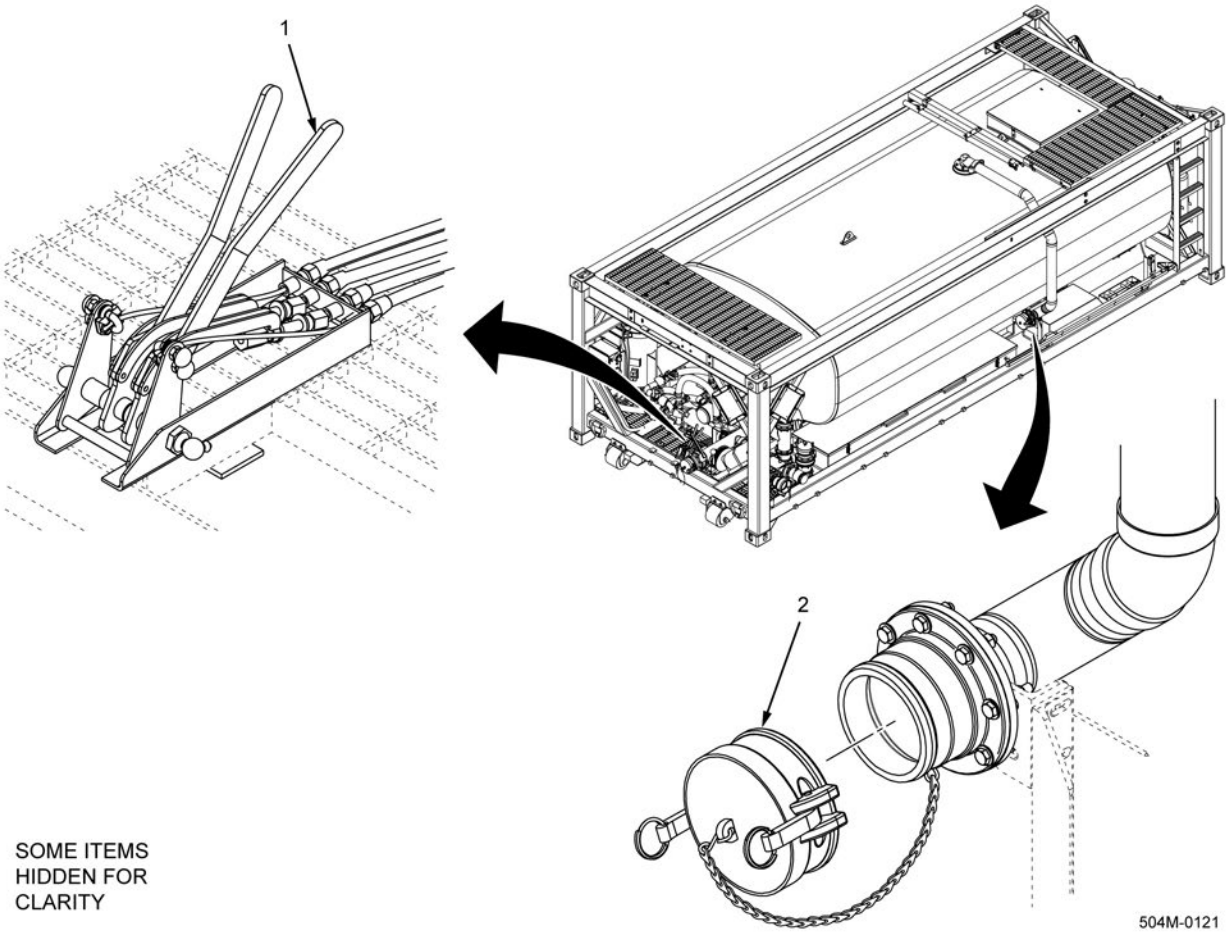


Figure 4. Fuel System Venting.

3. Place drip pan under filter/separator piping to be removed.
4. Close all valves.
5. Remove hose clamp (Figure 5, Item 8) and flexible hose (Figure 5, Item 7) from hose barb (Figure 5, Item 9).
6. Remove tube nut (Figure 5, Item 5) and tube (Figure 5, Item 6) from fitting (Figure 5, Item 4).
7. Mark orientation of coupling (Figure 5, Item 1) to inlet sampling probe (Figure 5, Item 2).
8. Remove inlet sampling probe (Figure 5, Item 2), union (Figure 5, Item 3), and fitting (Figure 5, Item 4) from coupling (Figure 5, Item 1).
9. Remove fitting (Figure 5, Item 4) from union (Figure 5, Item 3).

INLET PIPING DISASSEMBLY - Continued

10. Remove union (Figure 5, Item 3) from inlet sampling probe (Figure 5, Item 2).
11. Remove hose barb (Figure 5, Item 9) from elbow (Figure 5, Item 10).
12. Remove elbow (Figure 5, Item 10) from coupling (Figure 5, Item 1).
13. Remove drip pan and dispose of fuel IAW unit SOP.

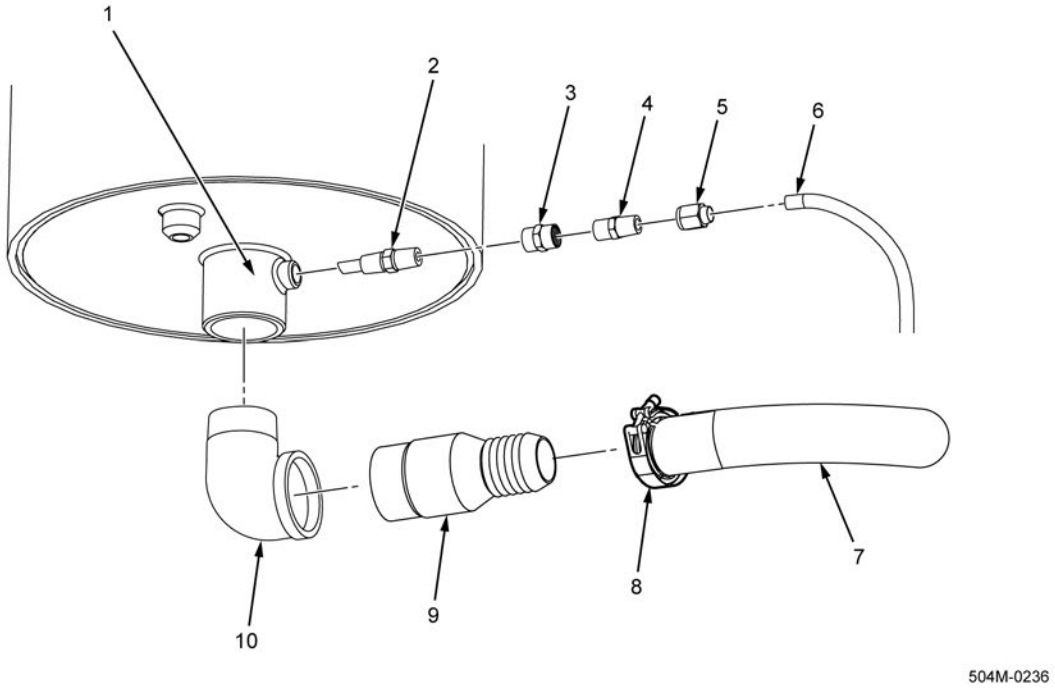


Figure 5. Filter/Separator Inlet Piping.

END OF TASK

CLEANING

WARNING

- Solvent cleaning compound MIL-PRF-680 Type III is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Keep away from open flames and other sources of ignition. Failure to comply may cause injury to personnel.
- Thread sealing compound is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Failure to comply may cause injury to personnel.

1. Clean any residual thread sealant from threads of all components.
2. Clean all metal parts with a cleaning cloth and solvent cleaning compound.
3. Allow parts to dry thoroughly.

END OF TASK

INLET PIPING ASSEMBLY

1. Apply thread sealing compound to all threaded fittings except where tube nut and ferrules are connected.
2. Install union (Figure 5, Item 3) on inlet sampling probe (Figure 5, Item 2).
3. Install fitting (Figure 5, Item 4) on union (Figure 5, Item 3).
4. Install elbow (Figure 5, Item 10) on coupling (Figure 5, Item 1).
5. Install hose barb (Figure 5, Item 9) on elbow (Figure 5, Item 10).
6. Install inlet sampling probe (Figure 5, Item 2) on coupling (Figure 5, Item 1) as noted during removal.
7. Install flexible hose (Figure 5, Item 7) with hose clamp (Figure 5, Item 8) on hose barb (Figure 5, Item 9).
8. Install tube nut (Figure 5, Item 5) and tube (Figure 5, Item 6) on fitting (Figure 5, Item 4).
9. Install vapor recovery line dust cap (Figure 6, Item 1).

INLET PIPING ASSEMBLY - Continued

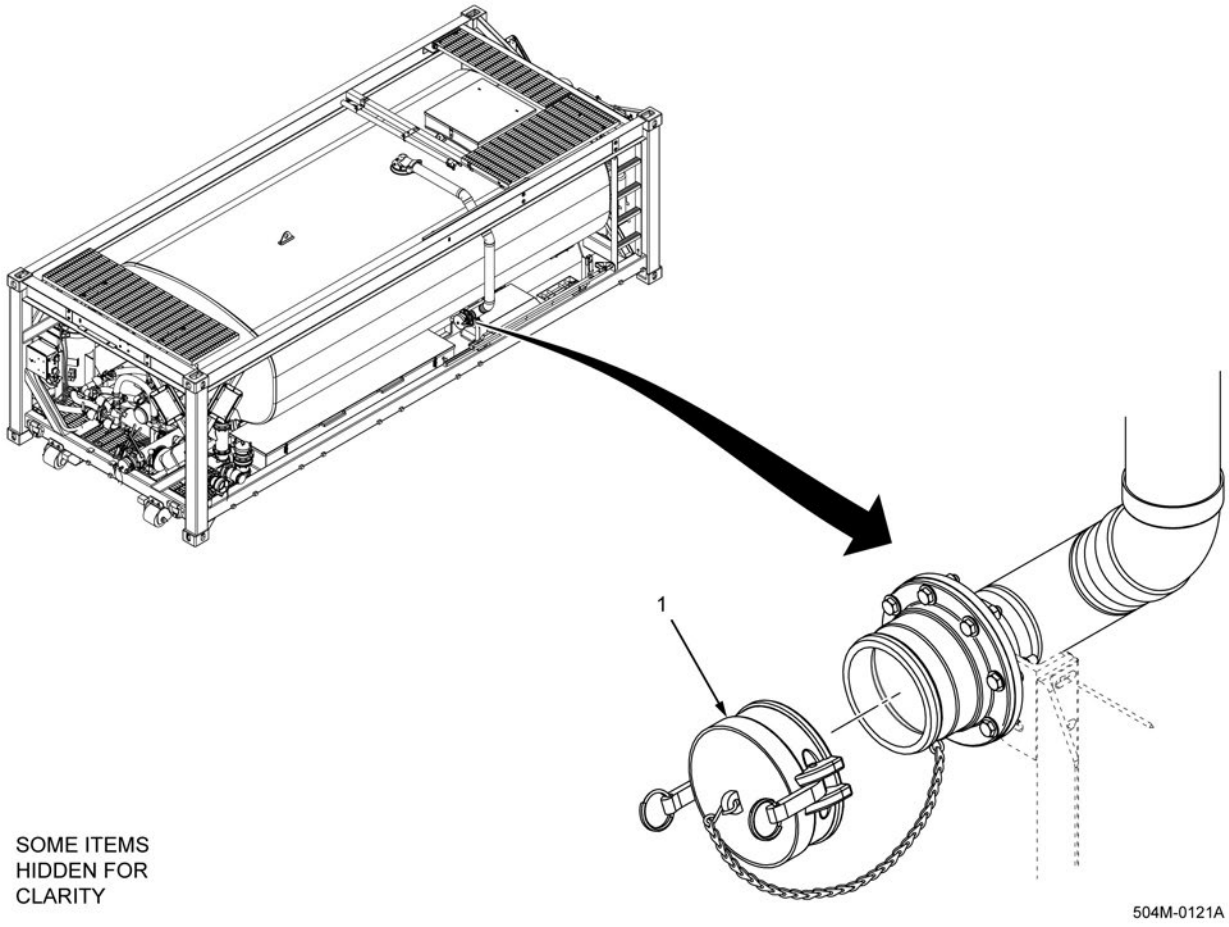


Figure 6. Installing Vapor Recovery Line Dust Cap.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Set up MFS TRM (TM 10-4930-371-10).
2. Check MFS TRM for leaks by recirculating fuel (TM 10-4930-371-10).

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
ISO RACK PLACARDS REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool kit, general mechanic's (WP 0217, Table 1, Item 13)

Materials/Parts
Nut, self-locking, hexagon (LOCKNUTS) Qty: 2 (WP 0206, Figure 60, Item 5)
ISO Rack Placards (WP 0206, Figure 60, Item 2)

Personnel Required
91J Quartermaster and Chemical Equipment Repairer

References
WP 0002

Equipment Condition
MFS TRM grounded (TM 10-4930-371-10)
MFS TRM shut down (TM 10-4930-371-10)

Time to Complete
0.1 Hour(s)

REMOVAL

NOTE

Four Locations — Procedure is the same at all four locations.

Remove two screws (Figure 1, Item 3), four flat washers (Figure 1, Item 4), and two locknuts (Figure 1, Item 1) and remove ISO rack placard (Figure 1, Item 2). Discard locknuts.

END OF TASK

INSTALLATION

Install ISO rack placard (Figure 1, Item 2) and secure with two screws (Figure 1, Item 3), four flat washers (Figure 1, Item 4), and two new locknuts (Figure 1, Item 1).

INSTALLATION - Continued

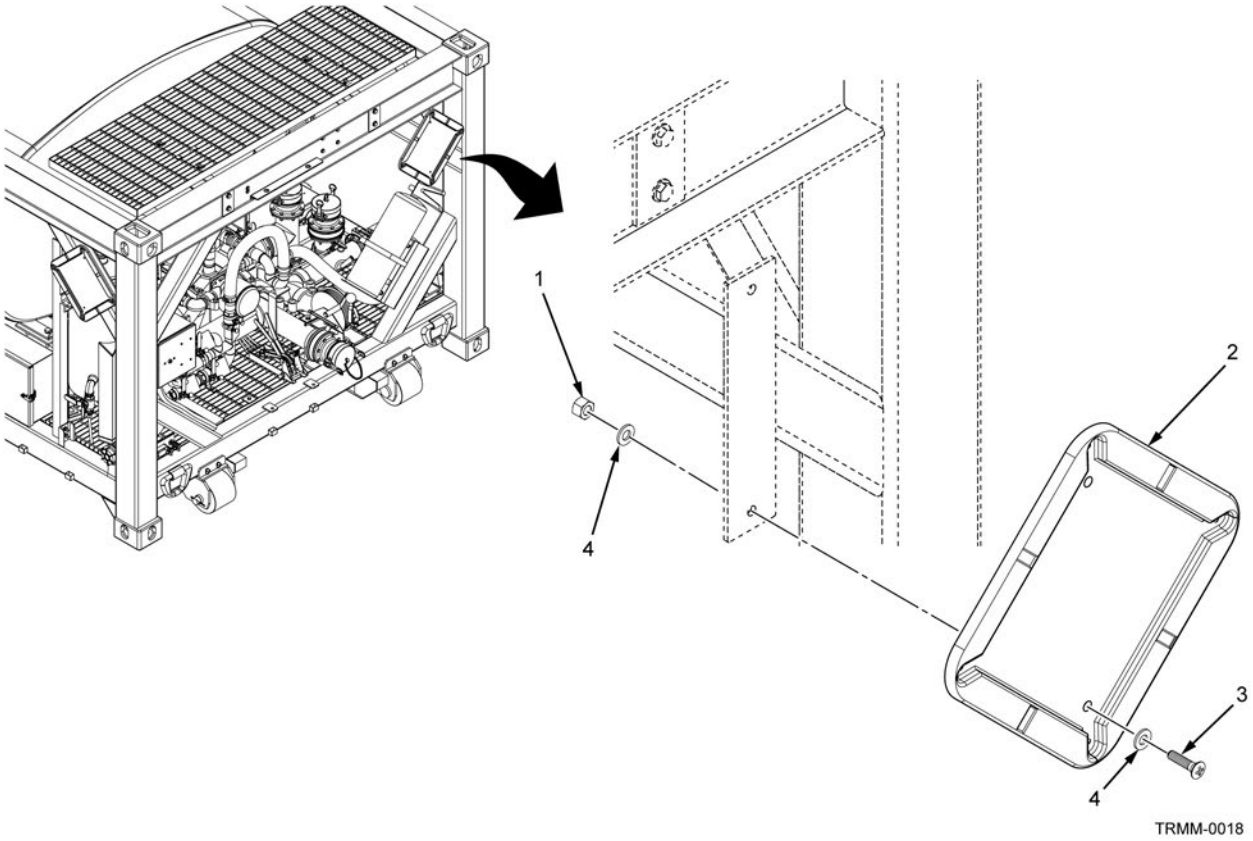


Figure 1. ISO Placard.

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
DATA PLATES REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool kit, general mechanic's (WP 0217, Table 1, Item 13)

Materials/Parts
Adhesive (WP 0216, Table 1, Item 2)
Cleaning Compound, Solvent (WP 0216, Table 1, Item 3)
Cloth, Cleaning (WP 0216, Table 1, Item 4)
Gloves, disposable nitrile (WP 0216, Table 1, Item 5)
MFS TRM data plates (WP 0207, Figure 61, Item 1)

Personnel Required
91J Quartermaster and Chemical Equipment Repairer

Equipment Condition
MFS TRM grounded (TM 10-4930-371-10)
MFS TRM shut down (TM 10-4930-371-10)

Time to Complete
0.2 Hour(s)

REMOVAL

NOTE

The following procedure applies to all data plates on the MFS TRM.

Remove data plate (Figure 1, Item 1) from MFS TRM.

END OF TASK

CLEANING

WARNING

Solvent cleaning compound MIL-PRF-680 Type III is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Keep away from open flames and other sources of ignition. Failure to comply may cause injury to personnel.

1. Clean area free of dirt, oil and old adhesive.
2. Allow area to dry thoroughly.

END OF TASK

INSTALLATION

1. Apply a thin bead of adhesive around the outside edge and center of data plate (Figure 1, Item 1).

INSTALLATION - Continued

2. Install data plate (Figure 1, Item 1) on MFS TRM and hold in place until adhesive sets (approximately 2 minutes).

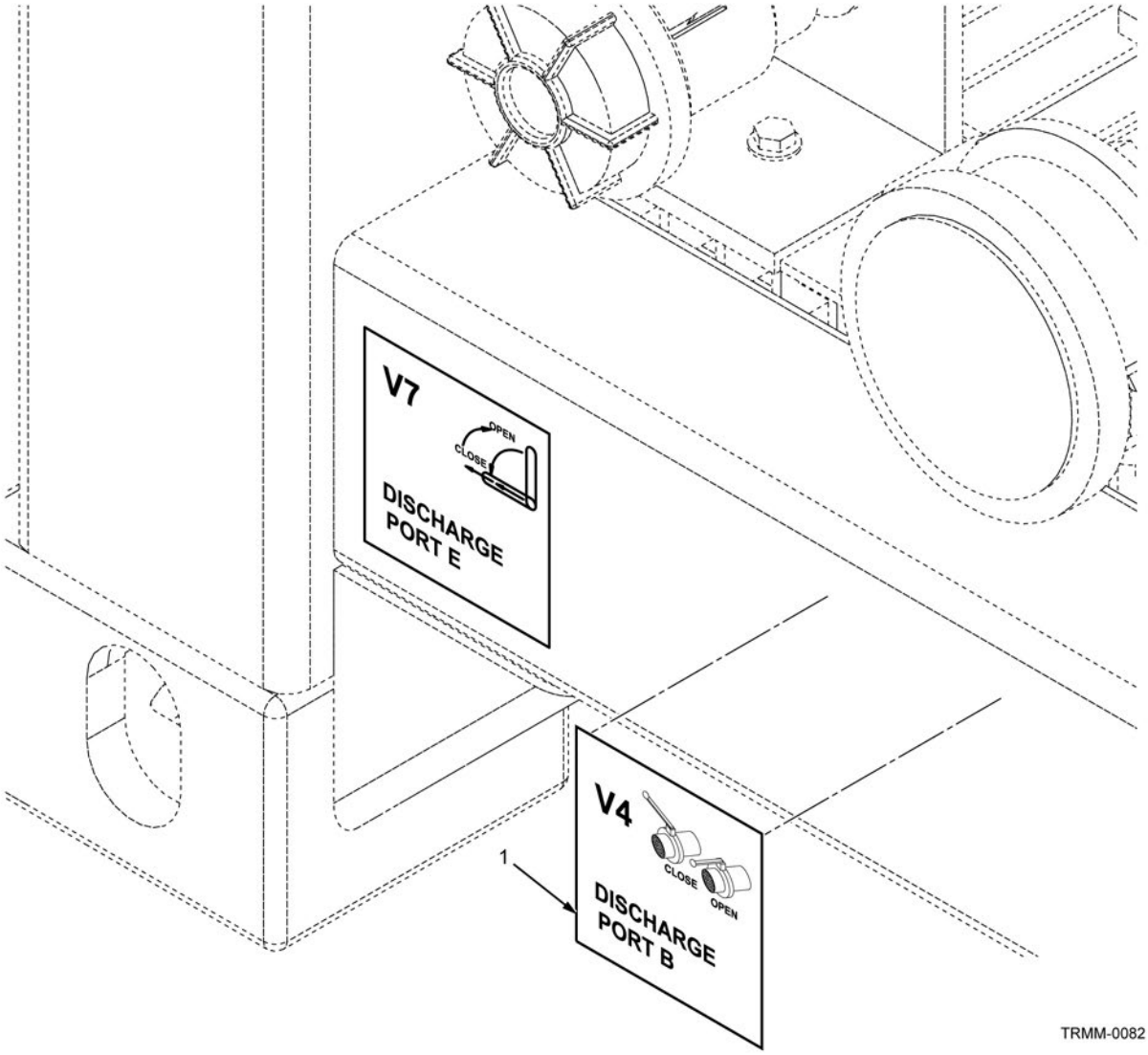


Figure 1. Data Plate.

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
STATIC REEL AND ADR BONDING CLAMP REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Multimeter, digital (WP 0217, Table 1, Item 6)
- Static cable (WP 0217, Table 1, Item 1)

Materials/Parts
- Nut, self-locking, hexagon (LOCKNUTS) Qty: 2 (WP 0208, Figure 62, Item 5)
- Nut, self-locking, hexagon (ADR) (WP 0208, Figure 62, Item 11)
- Lockwasher, internal tooth (ADR) Qty: 2 (WP 0208, Figure 62, Item 10)
- Bonding Clamp (ADR) (WP 0208, Figure 62, Item 9)
- Static Reel (WP 0208, Figure 62, Item 1)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer (2)

Equipment Condition
- MFS TRM grounded (TM 10-4930-371-10)
- MFS TRM shut down (TM 10-4930-371-10)

Time to Complete
- 0.5 Hour(s)

STATIC REEL REMOVAL

WARNING

Ensure alternate grounding source is connected to grounding source before removing static reel. Failure to do so may result in injury or death to personnel.

NOTE

Ensure metal to metal contact between MFS TRM and grounding source.

1. Ensure continuity of alternate grounding cable is equal to or less than 10 ohms. Then attach to MFS TRM.
2. Remove bolt (Figure 1, Item 1), two internal lock washers (Figure 1, Item 5), grounding cable (Figure 1, Item 6), grate clasp (Figure 1, Item 3), and locknut (Figure 1, Item 4) securing grounding cable (Figure 1, Item 6) and static reel (Figure 1, Item 7). Discard locknut.
3. Remove bolt (Figure 1, Item 1), two flat washers (Figure 1, Item 2), grate clasp (Figure 1, Item 3), and locknut (Figure 1, Item 4) securing static reel (Figure 1, Item 7). Discard locknut.
4. Remove static reel (Figure 1, Item 7).

STATIC REEL REMOVAL - Continued

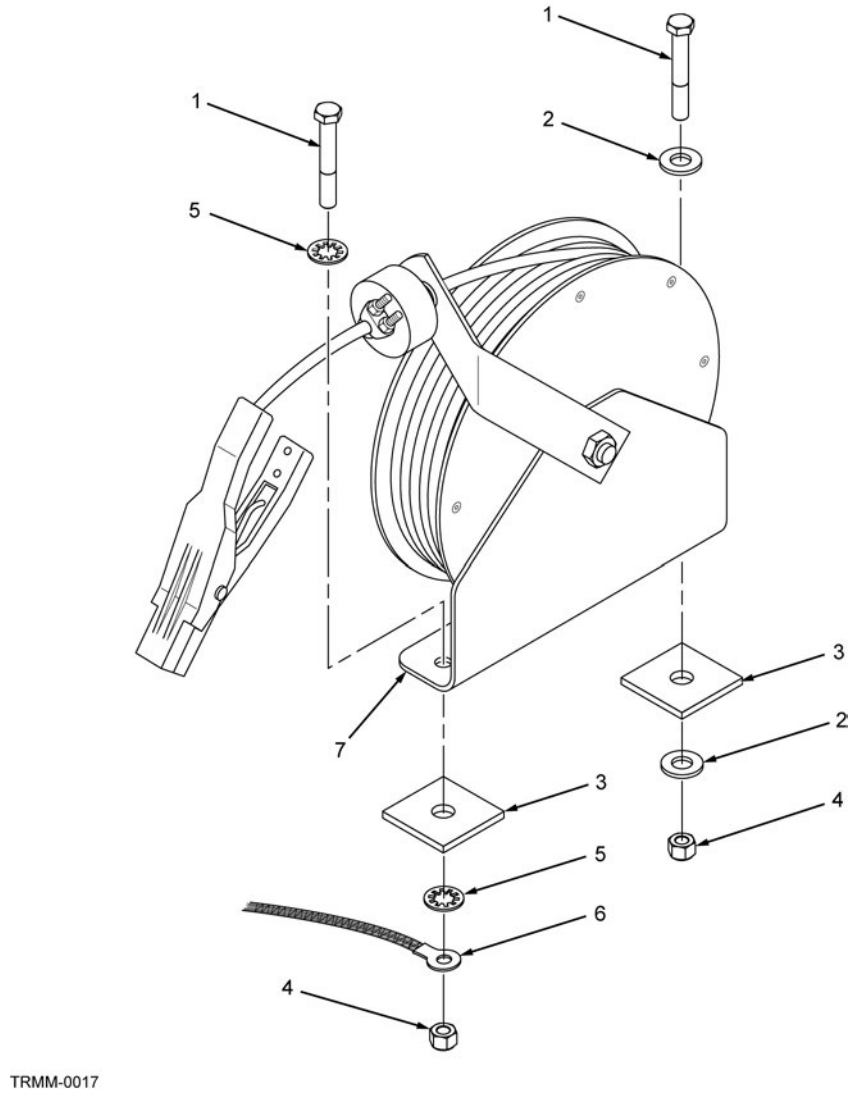


Figure 1. Static Reel.

END OF TASK

TRM WITH ADR BONDING CLAMP REMOVAL

WARNING

Ensure alternate grounding source is connected to grounding source before removing static reel. Failure to do so may result in injury or death to personnel.

TRM WITH ADR BONDING CLAMP REMOVAL - Continued

NOTE

Ensure metal to metal contact between TRM with ADR and grounding source.

1. Ensure continuity of alternate grounding cable is equal to or less than 10 ohms. Then attach to TRM with ADR.
2. Remove locknut (Figure 2, Item 7), two internal lock washers (Figure 2, Item 2), grounding cable (Figure 2, Item 5), bonding clamp cable (Figure 2, Item 6), grate clasp (Figure 2, Item 4), and bolt (Figure 2, Item 1) from static reel (Figure 2, Item 3). Discard locknut and internal lock washers.
3. Remove bonding clamp (Figure 2, Item 9) from TRM with ADR (Figure 2, Item 8).

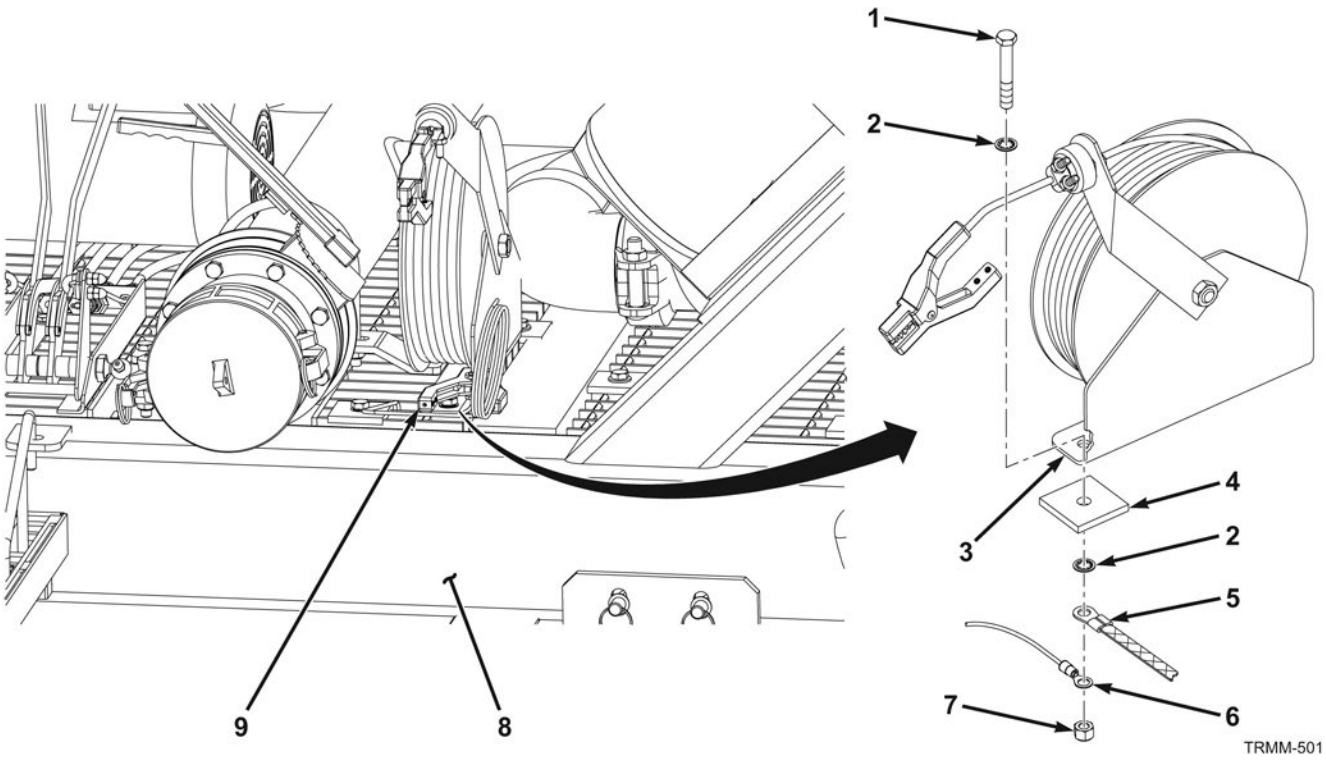


Figure 2. Bonding Clamp Replacement (TRM With ADR Only).

END OF TASK

TRM WITH ADR BONDING CLAMP INSTALLATION

1. Position bonding clamp (Figure 2, Item 9) on TRM with ADR (Figure 2, Item 8).
2. Install grounding cable (Figure 2, Item 5) and bonding clamp cable (Figure 2,Item 6) on static reel (Figure 2, Item 3) with bolt (Figure 2, Item 1), grate clasp (Figure 2, Item 4), two new internal lock washers (Figure 2, Item 2), and new locknut (Figure 2, Item 7).
3. Remove alternate grounding cable.

END OF TASK

STATIC REEL INSTALLATION

1. Install static reel (Figure 3, Item 7), bolt (Figure 3, Item 1), internal lock washer (Figure 3, Item 5), grating clasp (Figure 3, Item 3), internal lock washer (Figure 3, Item 5), grounding cable (Figure 3, Item 6), and new locknut (Figure 3, Item 4) to secure grounding cable (Figure 3, Item 6) and static reel (Figure 3, Item 7).
2. Install bolt (Figure 3, Item 1), flat washer (Figure 3, Item 2), grating clasp (Figure 3, Item 3) flat washer (Figure 3, Item 2), and new locknut (Figure 3, Item 4) to secure static reel (Figure 3, Item 7).
3. Remove alternate grounding cable.

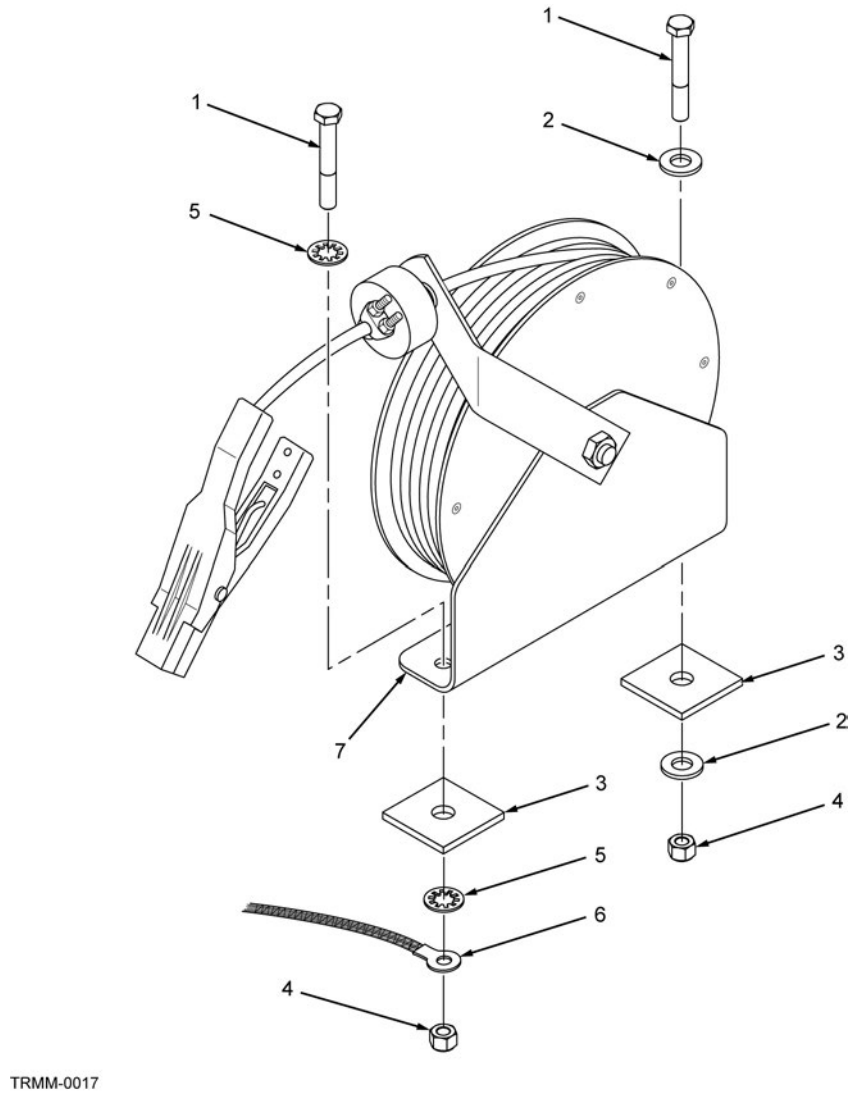


Figure 3. Static Reel.

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
FIRE EXTINGUISHER BRACKETS REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
Tool kit, general mechanic's (WP 0217, Table 1, Item 13)

Materials/Parts
Nut, self-locking, hexagon (LOCKNUTS) Qty: 4 (WP 0209, Figure 63, Item 5)
Fire Extinguisher Bracket Assembly (WP 0209, Figure 63, Item 4)

Personnel Required
91J Quartermaster and Chemical Equipment Repairer

Equipment Condition
MFS TRM grounded (TM 10-4930-371-10)
MFS TRM shut down (TM 10-4930-371-10)

Time to Complete
0.2 Hour(s)

REMOVAL

NOTE

The following procedure applies to both fire extinguishers and fire extinguisher brackets.

1. Release clamp (Figure 1, Item 2) and remove fire extinguisher (Figure 1, Item 1) from fire extinguisher bracket (Figure 1, Item 3).
2. Remove four locknuts (Figure 1, Item 5), eight flat washers (Figure 1, Item 4) and four bolts (Figure 1, Item 6) securing fire extinguisher bracket (Figure 1, Item 3) to MFS TRM frame and remove fire extinguisher bracket (Figure 1, Item 3). Discard locknuts.

REMOVAL - Continued

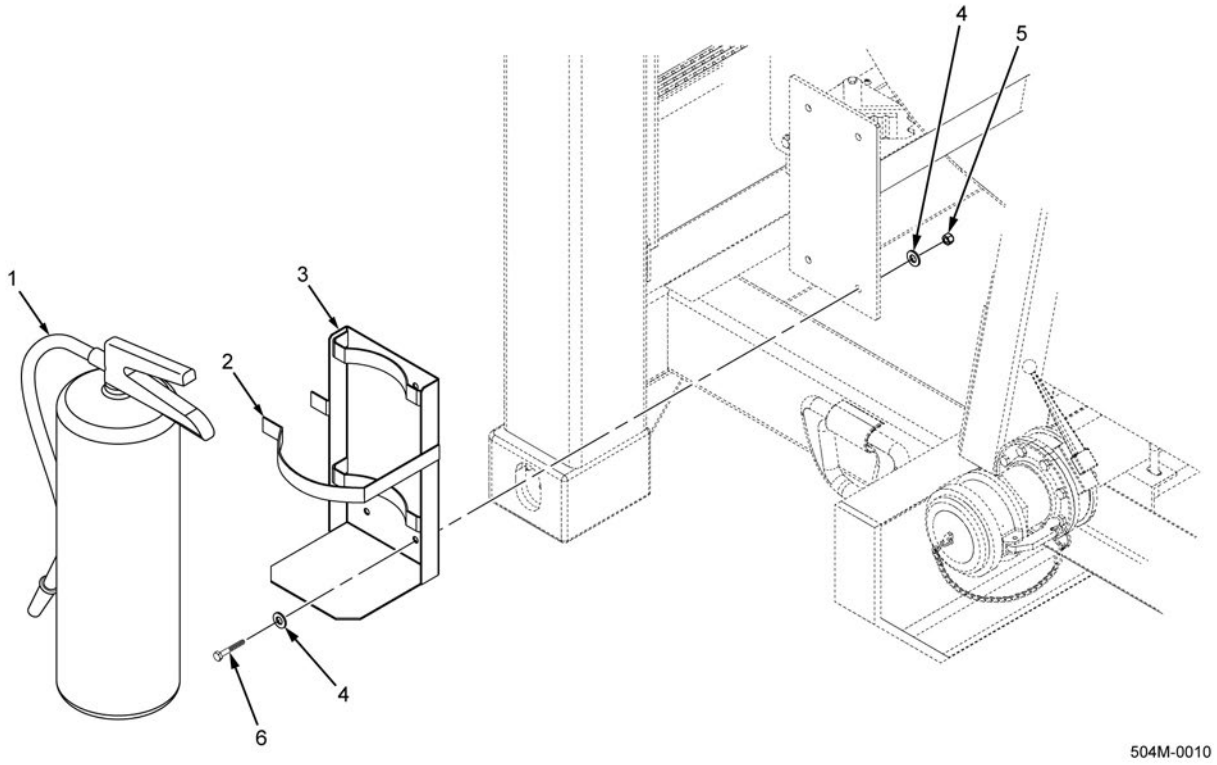


Figure 1. Fire Extinguisher Bracket.

END OF TASK

INSTALLATION

1. Install fire extinguisher bracket (Figure 1, Item 3) and secure with four bolts (Figure 1, Item 6), eight flat washers (Figure 1, Item 4) and four locknuts (Figure 1, Item 5).
2. Place fire extinguisher (Figure 1, Item 1) in fire extinguisher bracket (Figure 1, Item 3).
3. Fasten clamp (Figure 1, Item 2) to secure fire extinguisher (Figure 1, Item 1) in fire extinguisher bracket (Figure 1, Item 3).

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
TRM WITH ADR BALL VALVES (V21 AND V22) REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposable nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)
- Pan, drip (WP 0217, Table 1, Item 8)
- Wrench, adjustable, automotive (WP 0217, Table 1, Item 17)
- Wrench, internal pipe (WP 0217, Table 1, Item 18)
- Wrench, pipe, 18 inch (WP 0217, Table 1, Item 19)
- Vise, machinist's (WP 0217, Table 1, Item 14)

Materials/Parts
- Absorbent material (WP 0216, Table 1, Item 1)
- Cleaning compound, solvent (WP 0216, Table 1, Item 3)
- Cloth, cleaning (WP 0216, Table 1, Item 4)
- Sealing, compound (WP 0216, Table 1, Item 13)
- Thread sealing compound (WP 0216, Table 1, Item 15)

Materials/Parts (cont.)
- Valve ball 1 1/2" (V21) (WP 0189, Figure 43, Item 27)
- Valve ball 1 1/2" (V22) (WP 0189, Figure 43, Item 16)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer (2)

References
- ATP 4-43
- TM 10-4930-371-10

Equipment Condition
- MFS TRM shut down (TM 10-4930-371-10)
- MFS TRM grounded (TM 10-4930-371-10)
- MFS TRM drained (TM 10-4930-371-10)
- TRM with ADR strainer assembly removed (WP 0144.6)

Time to Complete
- 1.0 Hour(s)

STRAINER SECONDARY MANUAL SHUT OFF VALVE (V21) REMOVAL

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Failure to comply could result in injury or death to personnel.

NOTE

Note orientation of hardware and components to aid in installation.

1. Place drip pan under valve to catch residual fuel.
2. Place strainer assembly (Figure 1, Item 4) in vise.
3. Place ball valve handle (Figure 1, Item 5) into the open position.
4. Remove hose barb (Figure 1, Item 1) from strainer secondary manual shut off valve (V21) (Figure 1, Item 2).
5. Remove strainer secondary manual shut off valve (V21) (Figure 1, Item 2) from elbow (Figure 1, Item 3).

STRAINER SECONDARY MANUAL SHUT OFF VALVE (V21) REMOVAL - Continued

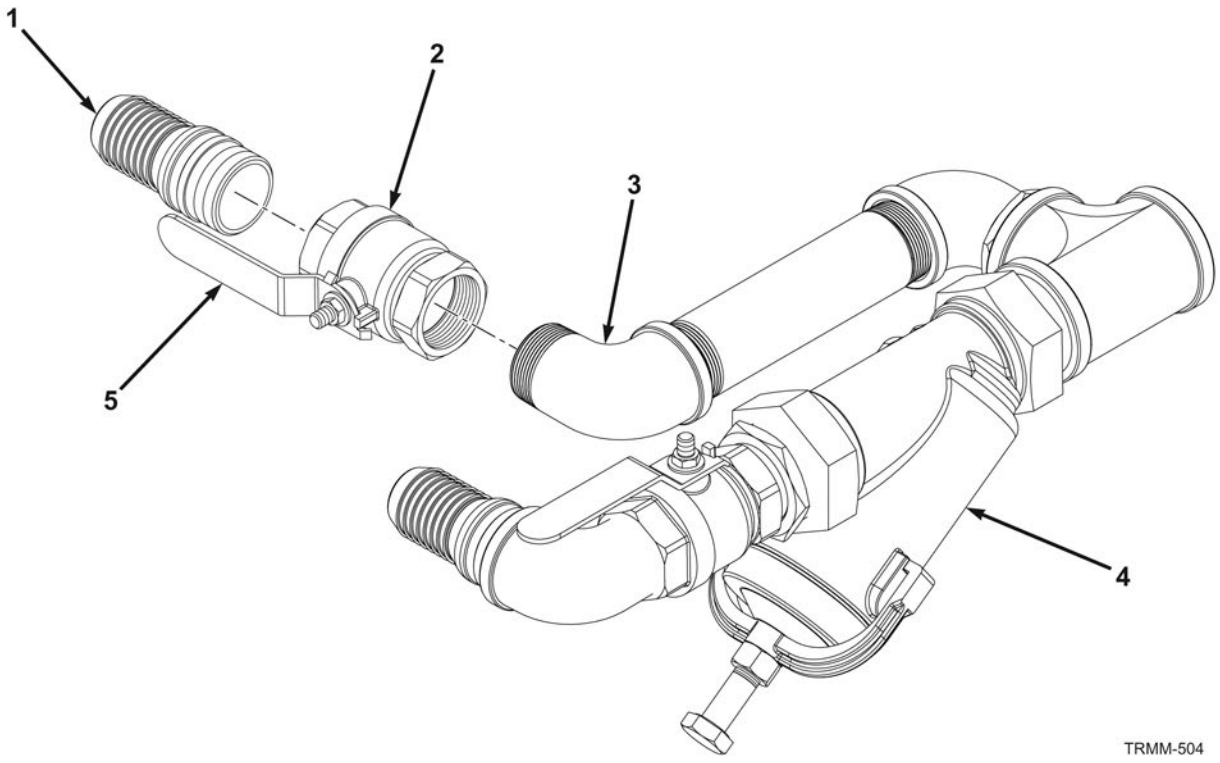


Figure 1. Removing Strainer Secondary Manual Shut Off Valve (V21).

6. Remove drip pan and dispose of fuel IAW unit SOP.

END OF TASK

STRAINER SECONDARY MANUAL SHUT OFF VALVE (V22) REMOVAL

NOTE

Note orientation of hardware and components to aid in installation.

1. Place drip pan under valve to catch residual fuel.
2. Place strainer assembly (Figure 2, Item 6) in vise.
3. Place ball valve handle (Figure 2, Item 3) into the open position.
4. Remove hose barb (Figure 2, Item 1) from elbow (Figure 2, Item 2).
5. Remove elbow (Figure 2, Item 2) from strainer secondary manual shut off valve (V22) (Figure 2, Item 7).
6. Remove strainer secondary manual shut off valve (V22) (Figure 2, Item 7) from bushing (Figure 2, Item 5).

NOTE

If nipple was removed with strainer secondary manual shut off valve (V22), perform Step 7.

7. Remove nipple (Figure 2, Item 4) from strainer secondary manual shut off valve (V22) (Figure 2, Item 7).

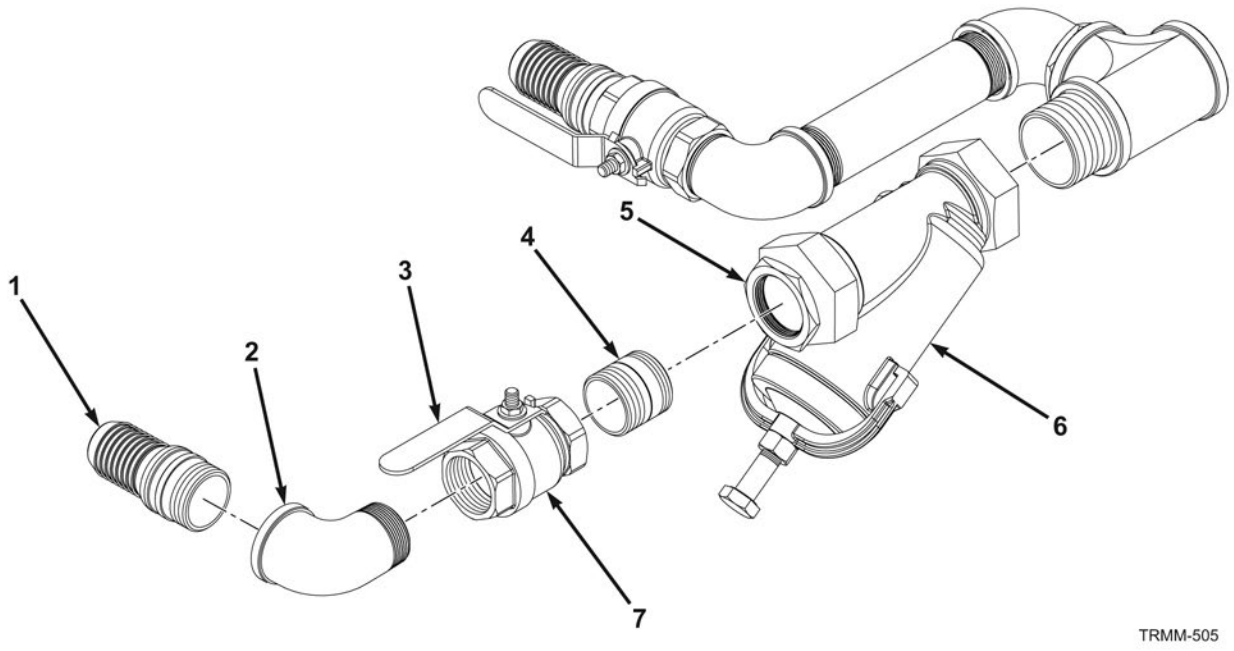


Figure 2. Removing Strainer Secondary Manual Shut Off Valve (V22).

END OF TASK

CLEANING

WARNING

Solvent cleaning compound MIL-PRF-680 Type III is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Keep away from open flames and other sources of ignition. Failure to comply may cause injury to personnel.

1. Clean all metal parts with a cleaning cloth and solvent cleaning compound.
2. Clean threads of all disassembled components. Remove all buildup of dirt, oil, and debris from threads.
3. Allow parts to dry thoroughly.

END OF TASK

STRAINER SECONDARY MANUAL SHUT OFF VALVE (V22) INSTALLATION

WARNING

Thread sealing compound is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Failure to comply may cause injury to personnel.

CAUTION

Once tightened, do not turn connections counterclockwise. Air leaks will be created and can cause leaks. Damage to equipment could occur.

1. Apply thread sealing compound to all threads.

NOTE

If nipple was removed, perform Step 2.

2. Install nipple (Figure 3, Item 4) on bushing (Figure 3, Item 5). Do not fully tighten.
3. Install strainer secondary manual shut off valve (V22) (Figure 3, Item 7) on nipple (Figure 3, Item 4) and bushing (Figure 3, Item 5).
4. Install elbow (Figure 3, Item 2) on strainer secondary manual shut off valve (V22) (Figure 3, Item 7).
5. Install hose barb (Figure 3, Item 1) on elbow (Figure 3, Item 2).
6. Place ball valve handle (Figure 3, Item 3) into the open position.

STRAINER SECONDARY MANUAL SHUT OFF VALVE (V22) INSTALLATION - Continued

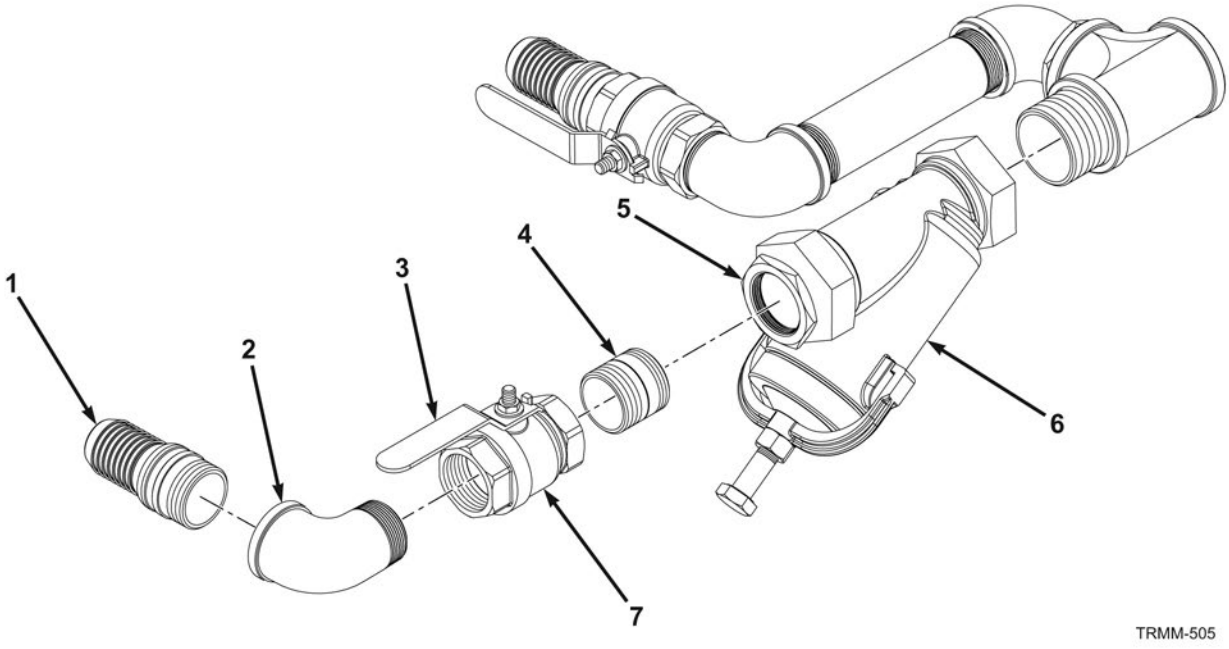


Figure 3. Installing Strainer Secondary Manual Shut Off Valve (V22).

END OF TASK

STRAINER SECONDARY MANUAL SHUT OFF VALVE (V21) INSTALLATION

WARNING

Thread sealing compound is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Failure to comply may cause injury to personnel.

CAUTION

Once tightened, do not turn connections counterclockwise. Air leaks will be created and can cause leaks. Damage to equipment could occur.

1. Apply thread sealing compound to all threads.
2. Install strainer secondary manual shut off valve (V21) (Figure 4, Item 2) on elbow (Figure 4, Item 3).
3. Install hose barb (Figure 4, Item 1) on strainer secondary manual shut off valve (V21) (Figure 4, Item 2).
4. Place ball valve handle (Figure 4, Item 5) into the open position.

STRAINER SECONDARY MANUAL SHUT OFF VALVE (V21) INSTALLATION - Continued

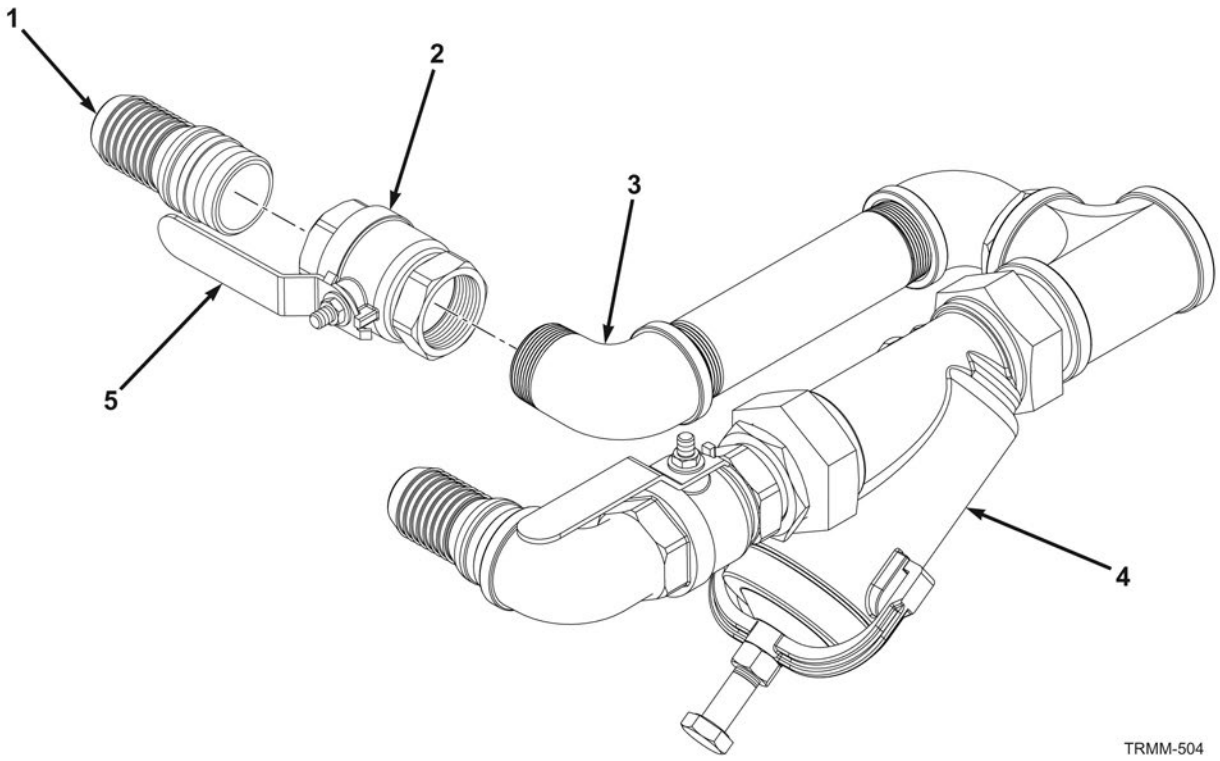


Figure 4. Installing Strainer Secondary Manual Shut Off Valve (V21).

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install TRM with ADR strainer assembly (WP 0144.6).
2. Set up the TRM (TM 10-4930-371-10).
3. Check the TRM for leaks by recirculating fuel (TM 10-4930-371-10).

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
ADR CHECK VALVE (V18 AND V19) REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposable nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)
- Pan, drip (WP 0217, Table 1, Item 8)

Materials/Parts
- Absorbent material (WP 0216, Table 1, Item 1)
- Cleaning compound, solvent (WP 0216, Table 1, Item 3)
- Cloth, cleaning (WP 0216, Table 1, Item 4)
- Thread sealing compound (WP 0216, Table 1, Item 15)
- Valve, check, air elimination (V18) (WP 0209.1, Figure 63.1, Item 10)
- Valve, check, jet sensor (V19) (WP 0209.1, Figure 63.1, Item 7)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer

References
- ATP 4-43
- TM 10-4930-371-10

Equipment Condition
- MFS TRM loaded on PLS trailer (TM 10-4930-371-10)
- MFS TRM grounded (TM 10-4930-371-10)
- MFS TRM shut down (TM 10-4930-371-10)
- MFS TRM drained (TM 10-4930-371-10)

Time to Complete
- 0.5 Hour(s)

REMOVAL

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Failure to comply could result in injury or death to personnel.

NOTE

Air elimination check valve (V18) and jet sensor check valve (V19) are removed the same way. Air elimination check valve (V18) is shown.

1. Remove vapor recovery line dust cap (Figure 1, Item 2).

REMOVAL - Continued

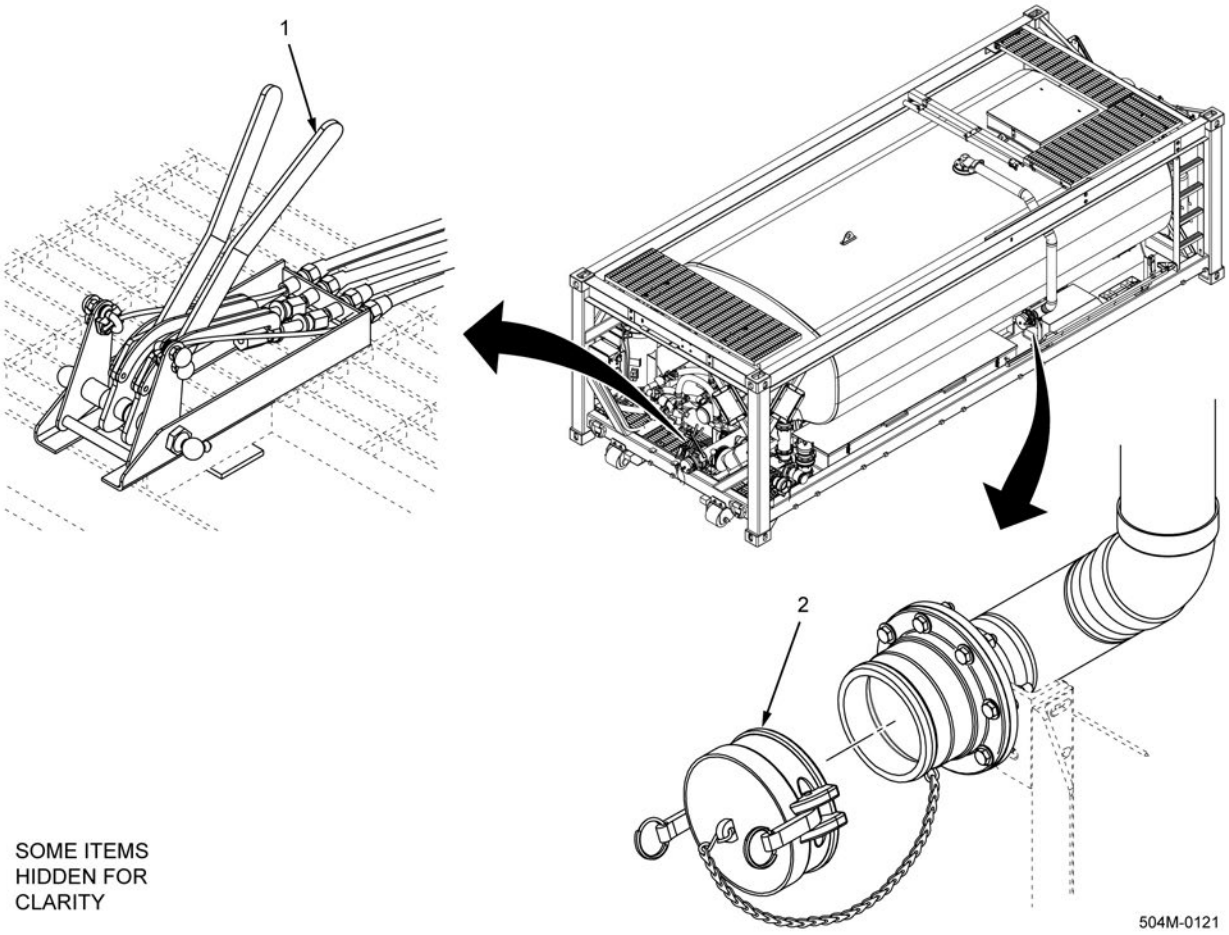


Figure 1. Fuel System Venting.

2. Momentarily open then close bottom loading valve (V1) (Figure 1, Item 1) to vent tank pressure.

REMOVAL - Continued

3. Place drip pan under check valve to catch residual fuel.
4. Loosen tube nut (Figure 2, Item 5) and disconnect tube (Figure 2, Item 6) from elbow (Figure 2, Item 1).

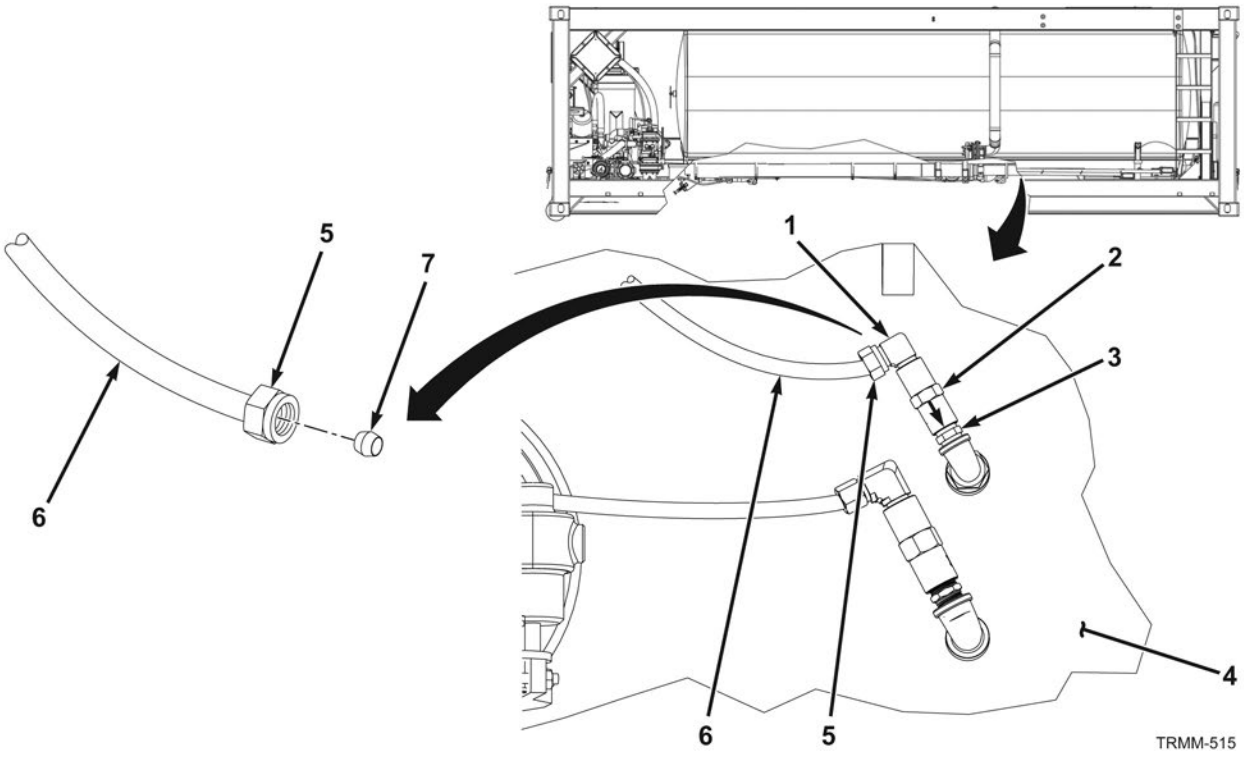


Figure 2. Removing Air Elimination Check Valve (V18).

NOTE

If tube nut or ferrule is damaged, perform Step 5.

5. Remove ferrule (Figure 2, Item 7) and tube nut (Figure 2, Item 5) from tube (Figure 2, Item 6). Discard tube nut and ferrule.
6. Remove elbow (Figure 2, Item 1) from air elimination check valve (V18) (Figure 2, Item 2).

NOTE

- Note orientation of air elimination check valve (V18) or jet sensor check valve (V19) prior to removal to ensure proper installation.
- Arrow embossed on air elimination check valve (V18) or jet sensor check valve (V19) must point toward tank (Figure 2, Item 4).

7. Remove air elimination check valve (V18) (Figure 2, Item 2) from nipple (Figure 2, Item 3).
8. Remove drip pan and dispose of fuel IAW unit SOP.
9. Clean parts in accordance with CLEANING task in this work package.

END OF TASK

CLEANING

WARNING

Solvent cleaning compound MIL-PRF-680 Type III is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Keep away from open flames and other sources of ignition. Failure to comply may cause injury to personnel.

1. Clean all metal parts with a cleaning cloth and solvent cleaning compound.
2. Clean threads of all disassembled components. Remove all buildup of dirt, oil, and debris from threads.
3. Allow parts to dry thoroughly.

END OF TASK

INSTALLATION

WARNING

Thread sealing compound is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Failure to comply may cause injury to personnel.

CAUTION

Once tightened, do not turn connections counterclockwise. Air leaks will be created and can cause leaks. Damage to equipment could occur.

NOTE

Air elimination check valve (V18) and jet sensor check valve (V19) are installed the same way. Air elimination check valve (V18) is shown.

1. Apply thread sealing compound to all threads.

NOTE

- Ensure air elimination check valve (V18) or jet sensor check valve (V19) is installed as noted during removal.
- Arrow embossed on air elimination check valve (V18) or jet sensor check valve (V19) must point toward tank (Figure 3, Item 4).

2. Install air elimination check valve (V18) (Figure 3, Item 2) on nipple (Figure 3, Item 3).

INSTALLATION - Continued

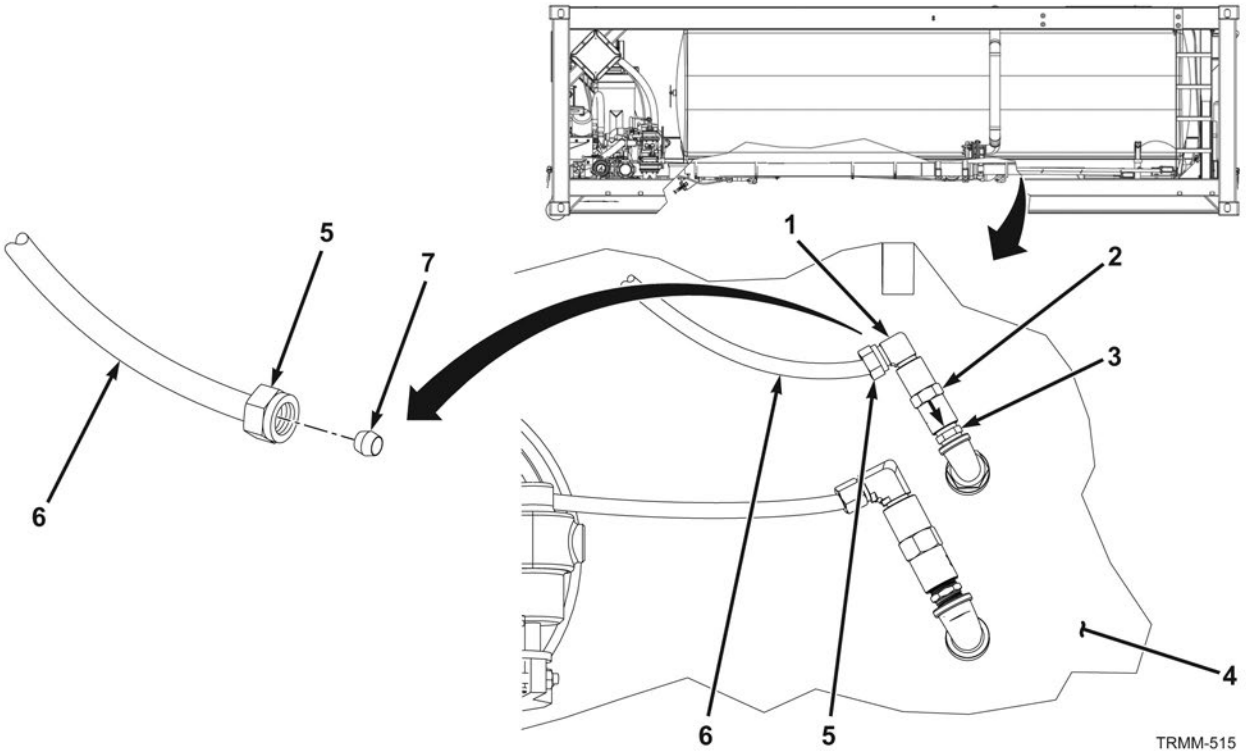


Figure 3. Installing Air Elimination Check Valve (V18).

3. Install elbow (Figure 3, Item 1) on air elimination check valve (V18) (Figure 3, Item 2).

NOTE

If tube nut or ferrule was removed, perform Step 4.

4. Install new tube nut (Figure 3, Item 5) and new ferrule (Figure 3, Item 7) on tube (Figure 3, Item 6).
5. Install tube (Figure 3, Item 6) on elbow (Figure 3, Item 1) with tube nut (Figure 3, Item 5).
6. Install vapor recovery line dust cap (Figure 4, Item 1).

INSTALLATION - Continued

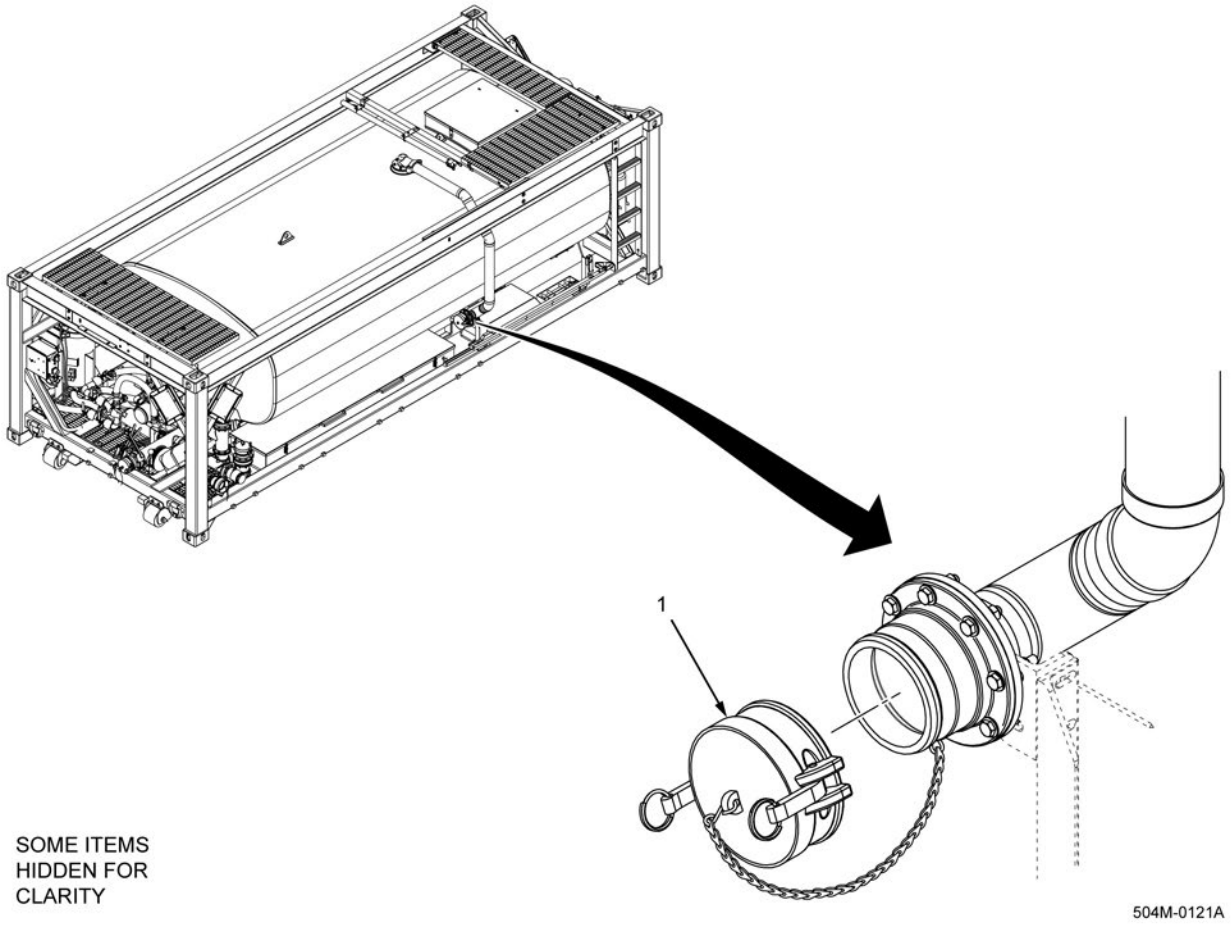


Figure 4. Installing Vapor Recovery Line Dust Cap.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Set up the TRM (TM 10-4930-371-10).
2. Check the TRM for leaks by recirculating fuel (TM 10-4930-371-10).

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
ADR CHECK VALVE (V23) REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposable nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)
- Pan, drip (WP 0217, Table 1, Item 8)

Materials/Parts
- Absorbent material (WP 0216, Table 1, Item 1)
- Cleaning compound, solvent (WP 0216, Table 1, Item 3)
- Cloth, cleaning (WP 0216, Table 1, Item 4)
- Sealing compound (WP 0216, Table 1, Item 13)
- Thread sealing compound (WP 0216, Table 1, Item 15)
- Valve, check, vacuum breaker (V23) (WP 0191, Figure 45, Item 11)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer

References
- ATP 4-43
- TM 10-4930-371-10
- WP 0108

Equipment Condition
- MFS TRM grounded (TM 10-4930-371-10)
- MFS TRM shut down (TM 10-4930-371-10)
- MFS TRM drained (TM 10-4930-371-10)

Time to Complete
- 0.5 Hour(s)

REMOVAL

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Failure to comply could result in injury or death to personnel.

REMOVAL - Continued

NOTE

- Note orientation of hardware and components to aid in installation.
- If preparing a TRM M107A1 with ADR for MFS operations, perform Steps 1 through 4 prior to installation of flex line, ferrule, and tube nut (WP 0108).

1. Remove breather vent (Figure 1, Item 5) from elbow (Figure 1, Item 4).
2. Remove elbow (Figure 1, Item 4) from vacuum breaker check valve (V23) (Figure 1, Item 3).
3. Remove vacuum breaker check valve (V23) (Figure 1, Item 3) from nipple (Figure 1, Item 2).
4. Remove nipple (Figure 1, Item 2) from elbow (Figure 1, Item 1).
5. Remove elbow (Figure 1, Item 1) from vacuum breaker (VB1) (Figure 1, Item 6).

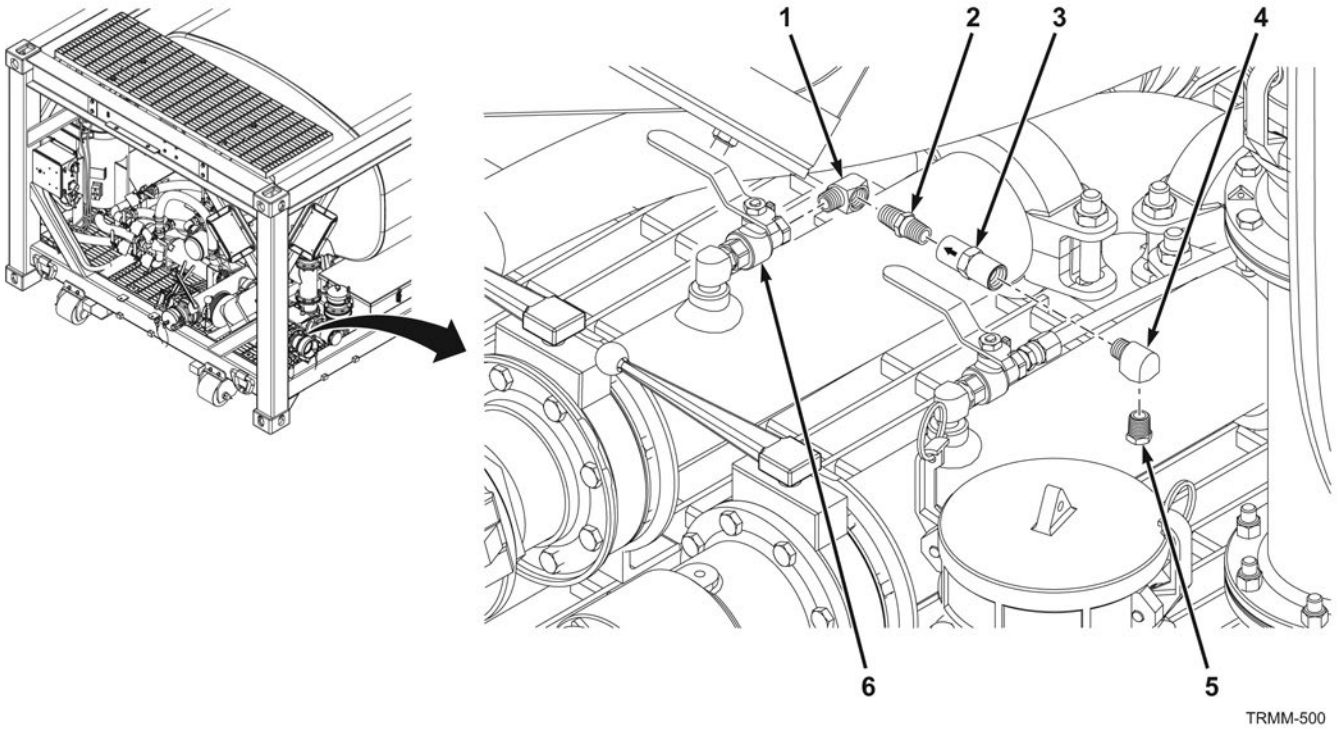


Figure 1. Removing Vacuum Breaker Check Valve (V23).

END OF TASK

CLEANING

WARNING

Solvent cleaning compound MIL-PRF-680 Type III is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Keep away from open flames and other sources of ignition. Failure to comply may cause injury to personnel.

1. Clean all metal parts with a cleaning cloth and solvent cleaning compound.
2. Clean threads of all disassembled components. Remove all buildup of dirt, oil, and debris from threads.
3. Allow parts to dry thoroughly.

END OF TASK

INSTALLATION

WARNING

Thread sealing compound is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Failure to comply may cause injury to personnel.

1. Apply thread sealing compound to all threads.

NOTE

Do not over rotate elbow on vacuum breaker (VB1). Clocking valve assembly cannot be reversed, or seal could be compromised.

2. Install elbow (Figure 2, Item 1) on vacuum breaker (VB1) (Figure 2, Item 6).
3. Install nipple (Figure 2, Item 2) on elbow (Figure 2, Item 1).
4. Install vacuum breaker check valve (V23) (Figure 2, Item 3) with arrow pointing towards nipple (Figure 2, Item 2).

NOTE

Do not over rotate elbow on vacuum breaker check valve (V23). Clocking valve assembly cannot be reversed, or seal could be compromised.

5. Install elbow (Figure 2, Item 4) on vacuum breaker check valve (V23) (Figure 2, Item 3).
6. Install breather vent (Figure 2, Item 5) on elbow (Figure 2, Item 4).

INSTALLATION - Continued

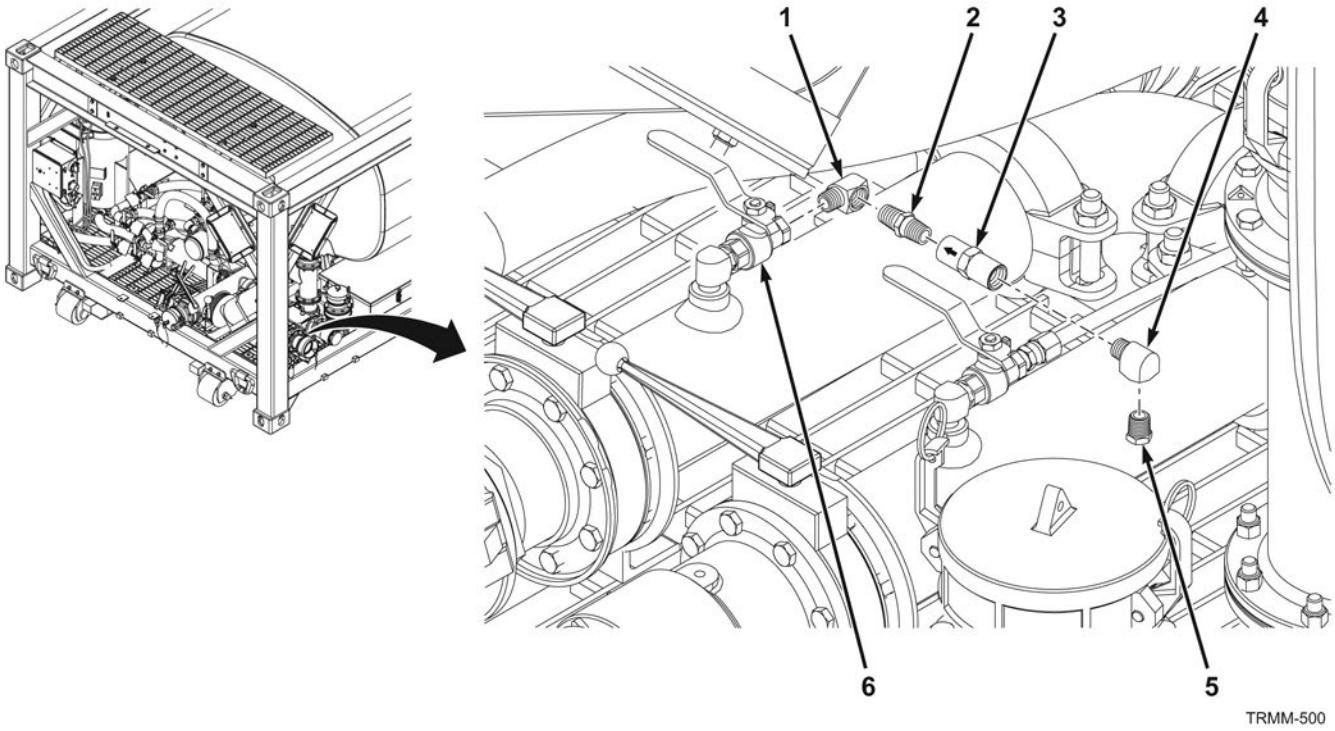


Figure 2. Installing Vacuum Breaker Check Valve (V23).

END OF TASK

FOLLOW-ON MAINTENANCE

1. Set up the TRM (TM 10-4930-371-10).
2. Check the TRM for leaks by recirculating fuel (TM 10-4930-371-10).

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
ADR FIRE SCREEN REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposable nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)

Materials/Parts
- Cleaning compound, solvent (WP 0216, Table 1, Item 3)
- Cloth, cleaning (WP 0216, Table 1, Item 4)
- Petrolatum, technical (WP 0216, Table 1, Item 10)
- Thread sealing compound (WP 0216, Table 1, Item 15)
- Fire Screen (WP 0152, Figure 6, Item 7)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer

Equipment Condition
- MFS TRM grounded (TM 10-4930-371-10)
- MFS TRM shut down (TM 10-4930-371-10)
- Handrail and handhold raised (TM 10-4930-371-10)

Time to Complete
- 0.5 Hour(s)

REMOVAL

WARNING

Climbing on top of the MFS TRM presents a fall hazard. Use handrail assembly and handholds at all times and always use “three point contact” with the MFS TRM when climbing on top of the tank to avoid falls. “Three point contact” means that one hand and two feet, or two hands and one foot are in contact with the MFS TRM at all times when climbing on top of the tank. Failure to comply could result in injury or death to personnel.

1. Remove vapor recovery line dust cap (Figure 1, Item 2).
2. Momentarily open then close bottom loading valve V1 (Figure 1, Item 1) to vent tank pressure.

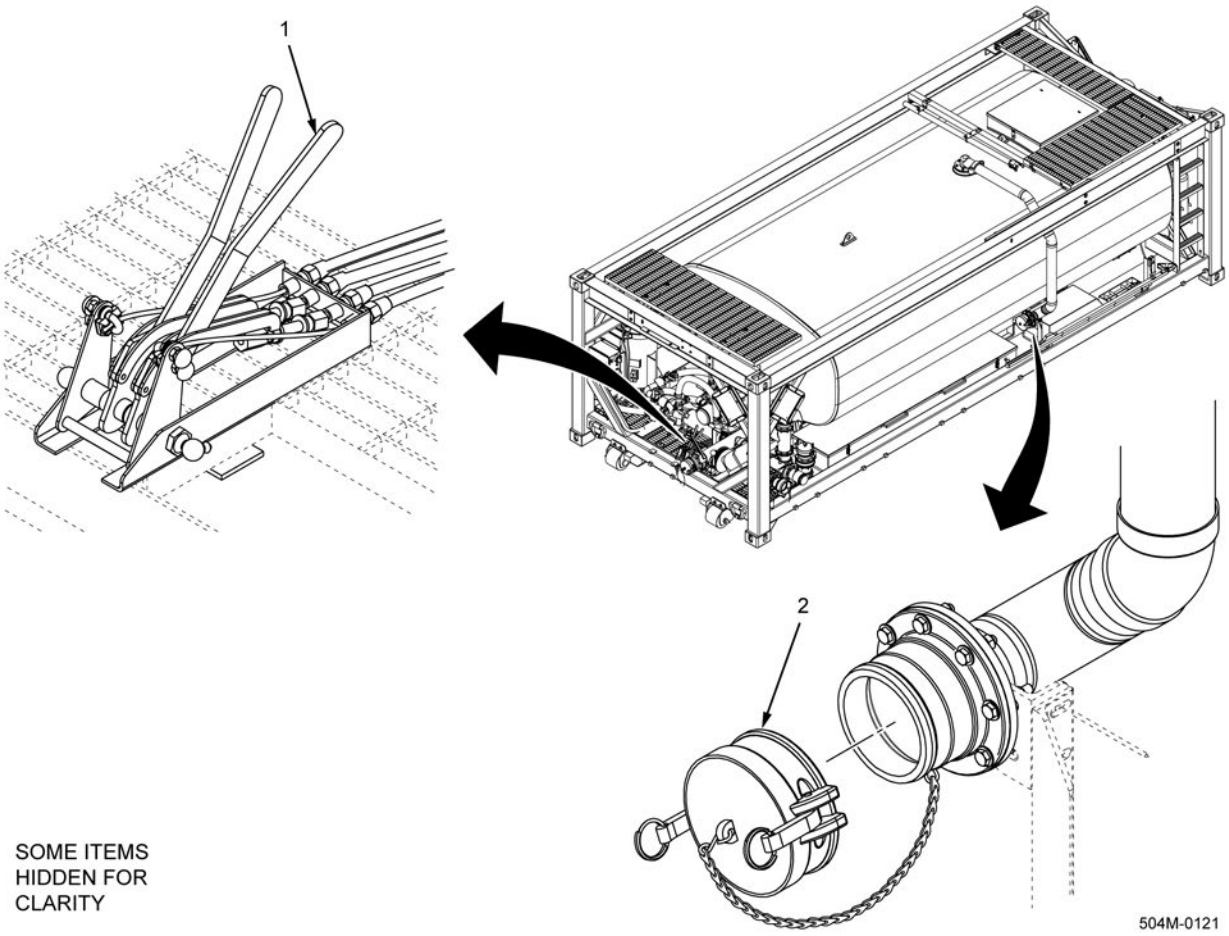


Figure 1. Fuel System Venting.

REMOVAL - Continued

3. Open spillbox lid (Figure 2, Item 2).
4. Open manhole fill cover (Figure 2, Item 1).

CAUTION

Ensure not to drop components inside tank when replacing fire screen.

5. Remove fire screen (Figure 2, Item 3) from manhole fill cover (Figure 2, Item 1). Discard fire screen.

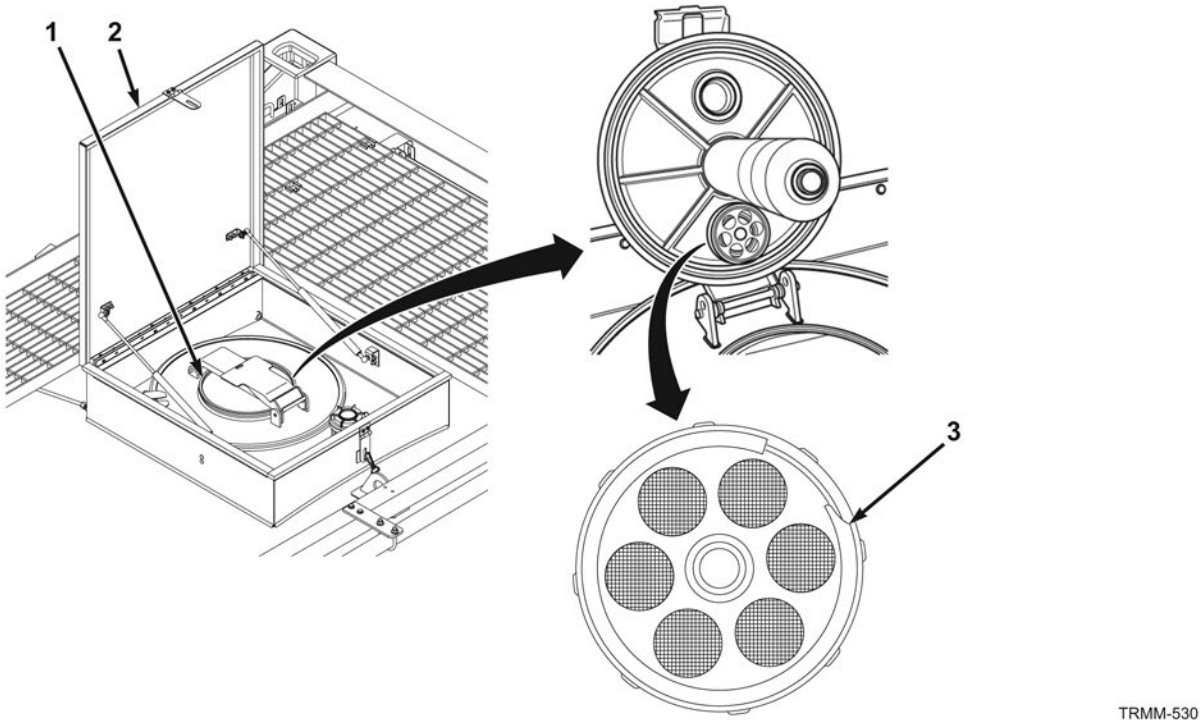


Figure 2. Removing Fire Screen.

END OF TASK

CLEANING

WARNING

Solvent cleaning compound MIL-PRF-680 Type III is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Keep away from open flames and other sources of ignition. Failure to comply may cause injury to personnel.

1. Clean all metal parts with a cleaning cloth and solvent cleaning compound.
2. Allow parts to dry thoroughly.

END OF TASK

INSTALLATION

WARNING

Thread sealing compound is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Failure to comply may cause injury to personnel.

1. Apply thread sealing compound to threads of new fire screen (Figure 3, Item 3).
2. Install new fire screen (Figure 3, Item 3) on manhole fill cover (Figure 3, Item 1).
3. Close manhole cover (Figure 3, Item 1).
4. Close spillbox lid (Figure 3, Item 2).

INSTALLATION - Continued

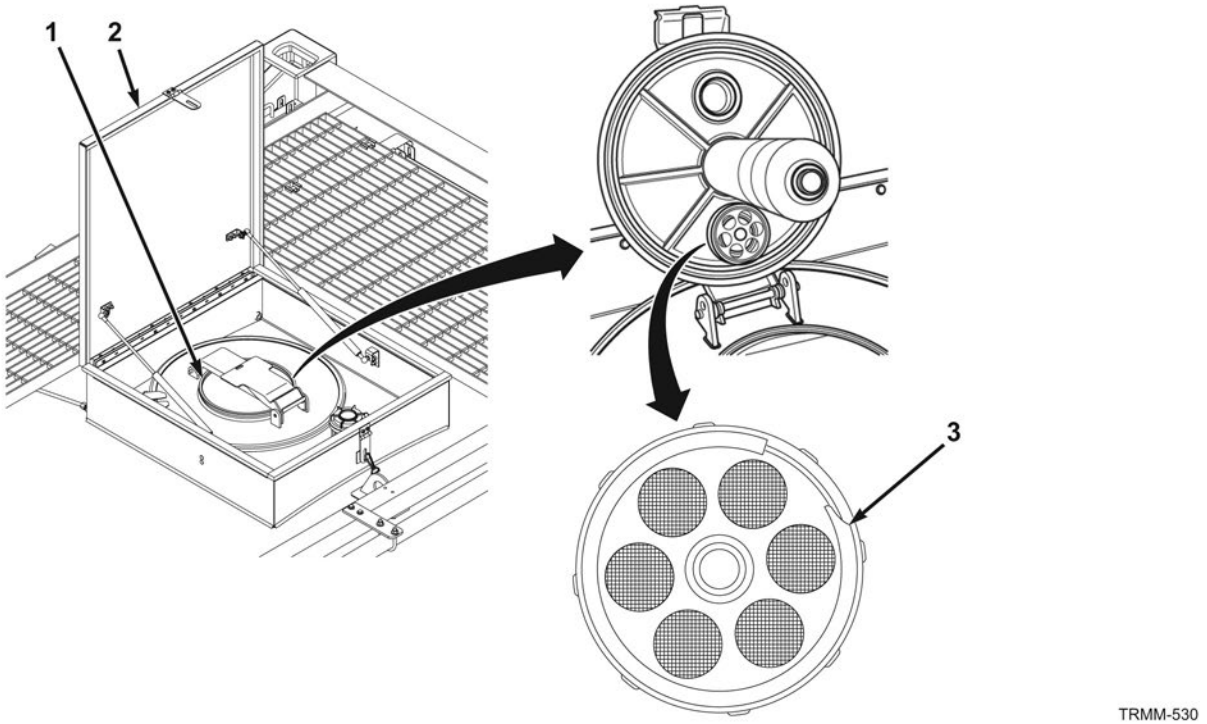


Figure 3. Installing Fire Screen.

INSTALLATION - Continued

5. Install vapor recovery line dust cap (Figure 4, Item 1).

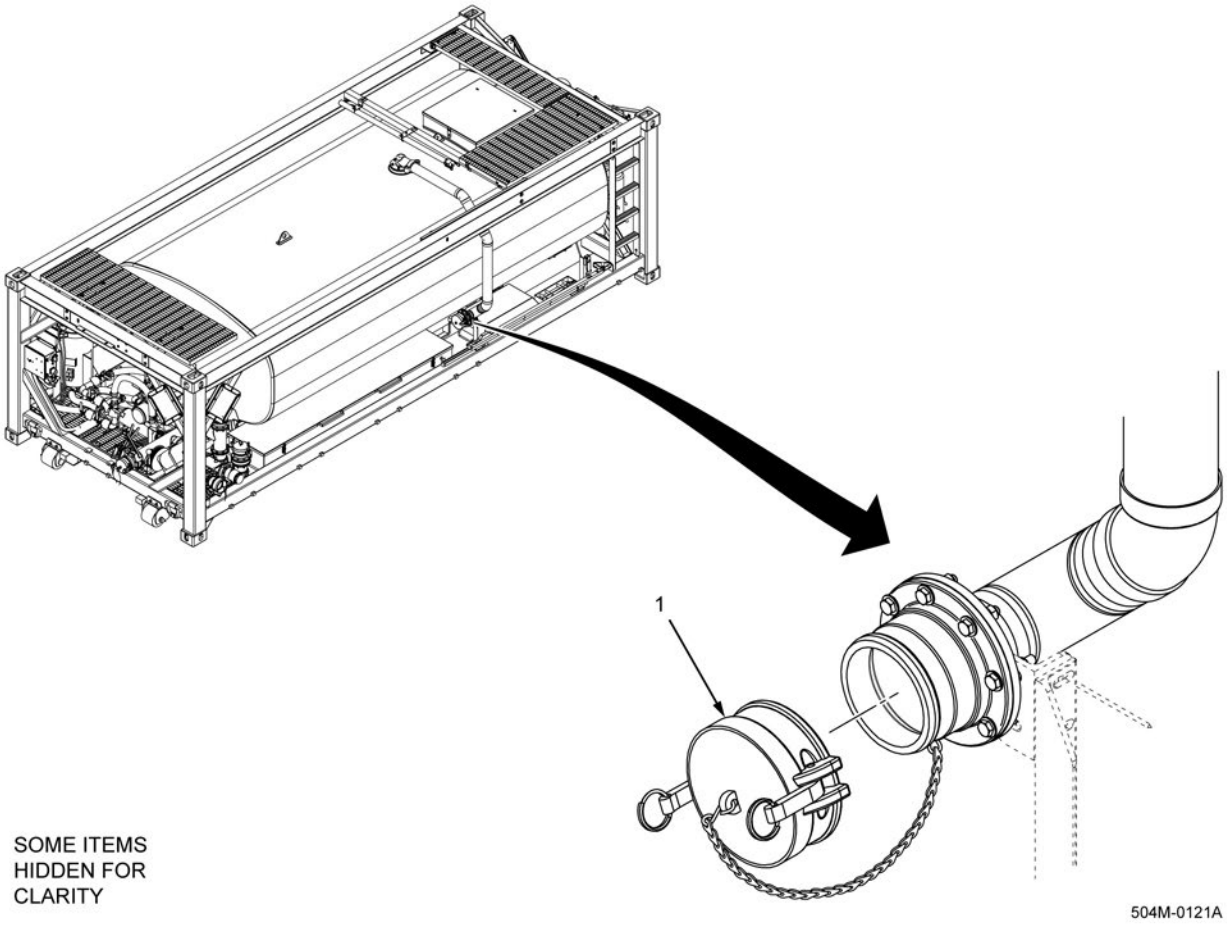


Figure 4. Installing Vapor Recovery Line Dust Cap.

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
ADR METER OUTLET BALL VALVE (V14) REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposable nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)
- Pan, drip (WP 0217, Table 1, Item 8)
- Vise, machinist's (WP 0217, Table 1, Item 14)
- Wire brush (WP 0217, Table 1, Item 15)
- Wrench, adjustable, automotive (WP 0217, Table 1, Item 17)
- Wrench, internal pipe (WP 0217, Table 1, Item 18)
- Wrench, pipe, 18 inch (WP 0217, Table 1, Item 19)

Materials/Parts
- Absorbent material (WP 0216, Table 1, Item 1)
- Cloth, cleaning (WP 0216, Table 1, Item 4)
- Cleaning compound, solvent (WP 0216, Table 1, Item 3)
- Thread sealing compound (WP 0216, Table 1, Item 15)

Materials/Parts (cont.)
- Ball valve (TRM without ADR) (WP 0190, Figure 44, Item 3)
- Ball valve (TRM with ADR) (WP 0188, Figure 42, Item 12)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer

References
- ATP 4-43
- TM 10-4930-371-10

Equipment Condition
- MFS TRM grounded (TM 10-4930-371-10)
- MFS TRM piping manifold evacuated (TM 10-4930-371-10)
- (V14) ball valve placard removed (WP 0089)

Time to Complete
- 0.5 Hour(s)

REMOVAL

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Failure to comply could result in injury or death to personnel.

REMOVAL - Continued

NOTE

Note orientation of hardware and components to aid in installation.

1. Remove vapor recovery line dust cap (Figure 1, Item 2).
2. Momentarily open then close bottom loading valve (V1) (Figure 1, Item 1) to vent tank pressure.

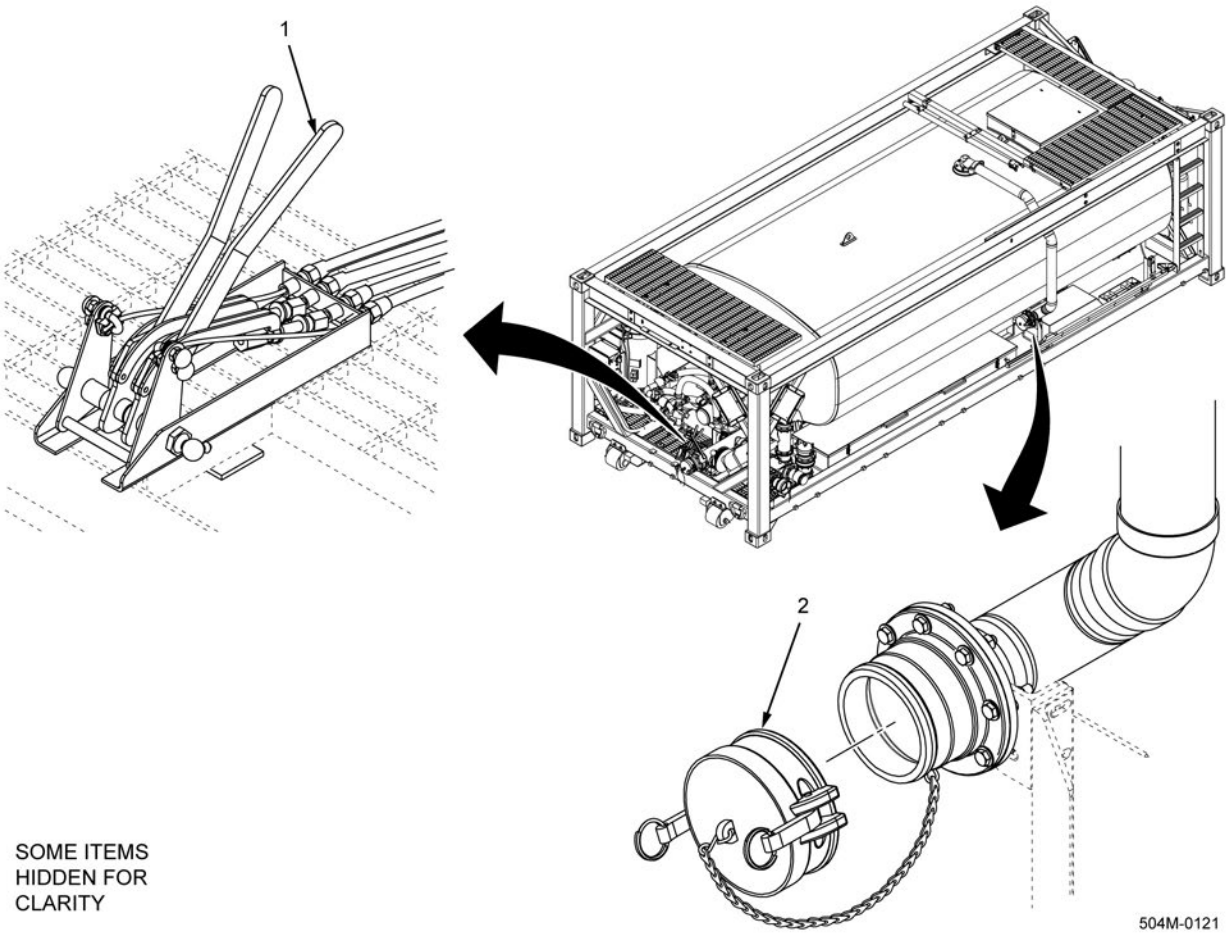


Figure 1. Fuel System Venting.

3. Place drip pan under valve to catch residual fuel.
4. Remove clamp (Figure 2, Item 2) and flexible hose (Figure 2, Item 1) from hose barb (Figure 2, Item 3).
5. Place ball valve handle (Figure 2, Item 5) into the open position.
6. Remove hose barb (Figure 2, Item 3) from meter outlet ball valve (V14) (Figure 2, Item 4).
7. Remove meter outlet ball valve (V14) (Figure 2, Item 4) from nipple (Figure 2, Item 6) and pipe assembly (Figure 2, Item 7).

NOTE

If nipple was removed with meter outlet ball valve (V14), perform Step 8.

8. Remove nipple (Figure 2, Item 6) from meter outlet ball valve (V14) (Figure 2, Item 4).

REMOVAL - Continued

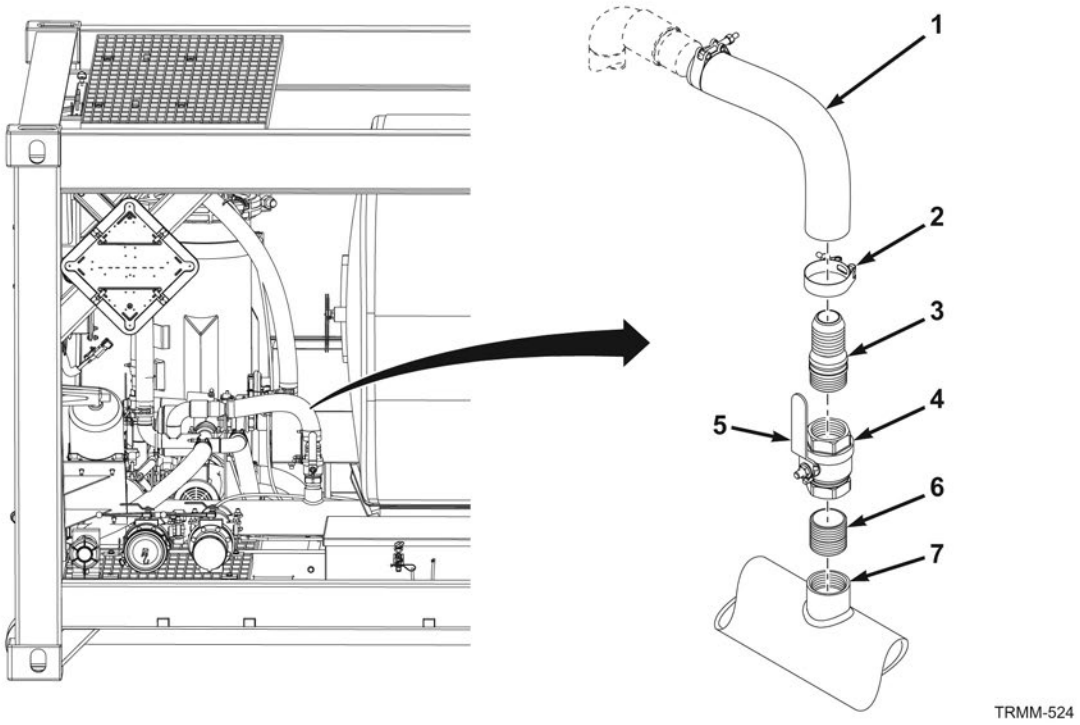


Figure 2. Removing Meter Outlet Ball Valve (V14).

END OF TASK

CLEANING

WARNING

Solvent cleaning compound MIL-PRF-680 Type III is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Keep away from open flames and other sources of ignition. Failure to comply may cause injury to personnel.

1. Clean all metal parts with a cleaning cloth and solvent cleaning compound.
2. Clean threads of all disassembled components. Remove all buildup of dirt, oil, and debris from threads.
3. Allow parts to dry thoroughly.

END OF TASK

INSTALLATION

WARNING

Thread sealing compound is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Failure to comply may cause injury to personnel.

CAUTION

Once tightened, do not turn connections counterclockwise. Air leaks will be created and can cause leaks. Damage to equipment could occur.

1. Apply thread sealing compound to all threads.

NOTE

If nipple was removed, perform Step 2.

2. Install nipple (Figure 3, Item 6) on pipe assembly (Figure 3, Item 7). Do not fully tighten.
3. Install meter outlet ball valve (V14) (Figure 3, Item 4) on nipple (Figure 3, Item 6) and pipe assembly (Figure 3, Item 7).
4. Install hose barb (Figure 3, Item 3) on meter outlet ball valve (V14) (Figure 3, Item 4).
5. Install flexible hose (Figure 3, Item 1) on hose barb (Figure 3, Item 3) with clamp (Figure 3, Item 2).
6. Place ball valve handle (Figure 3, Item 5) into the open position.

INSTALLATION - Continued

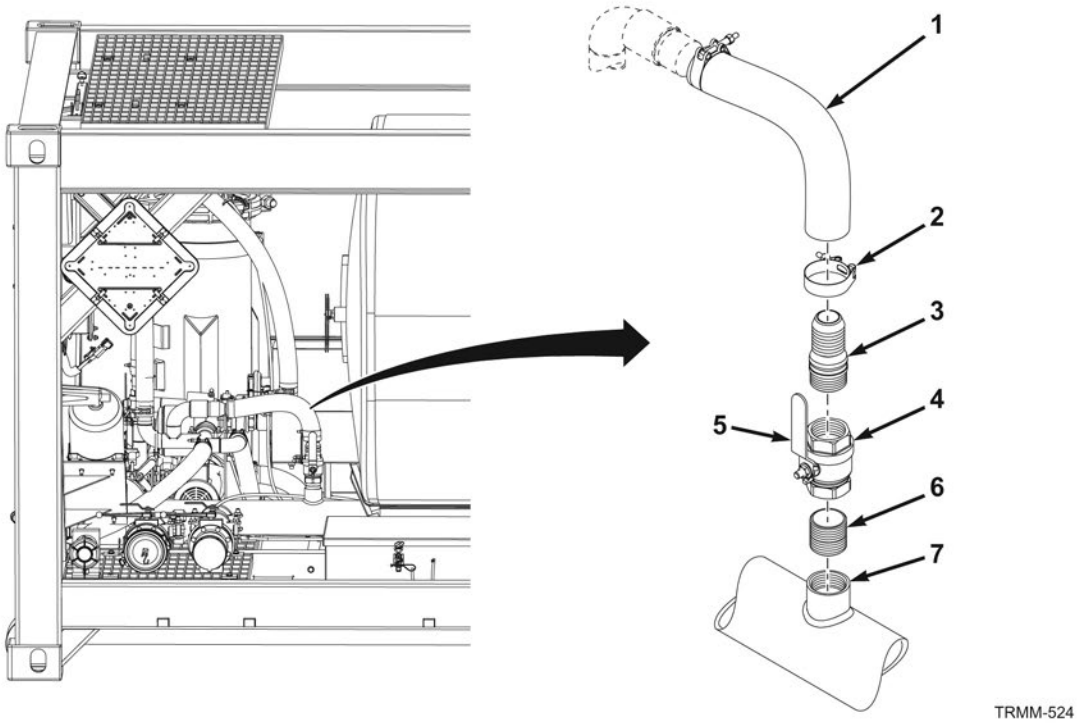


Figure 3. Installing Meter Outlet Ball Valve (V14).

INSTALLATION - Continued

7. Install vapor recovery line dust cap (Figure 4, Item 1).

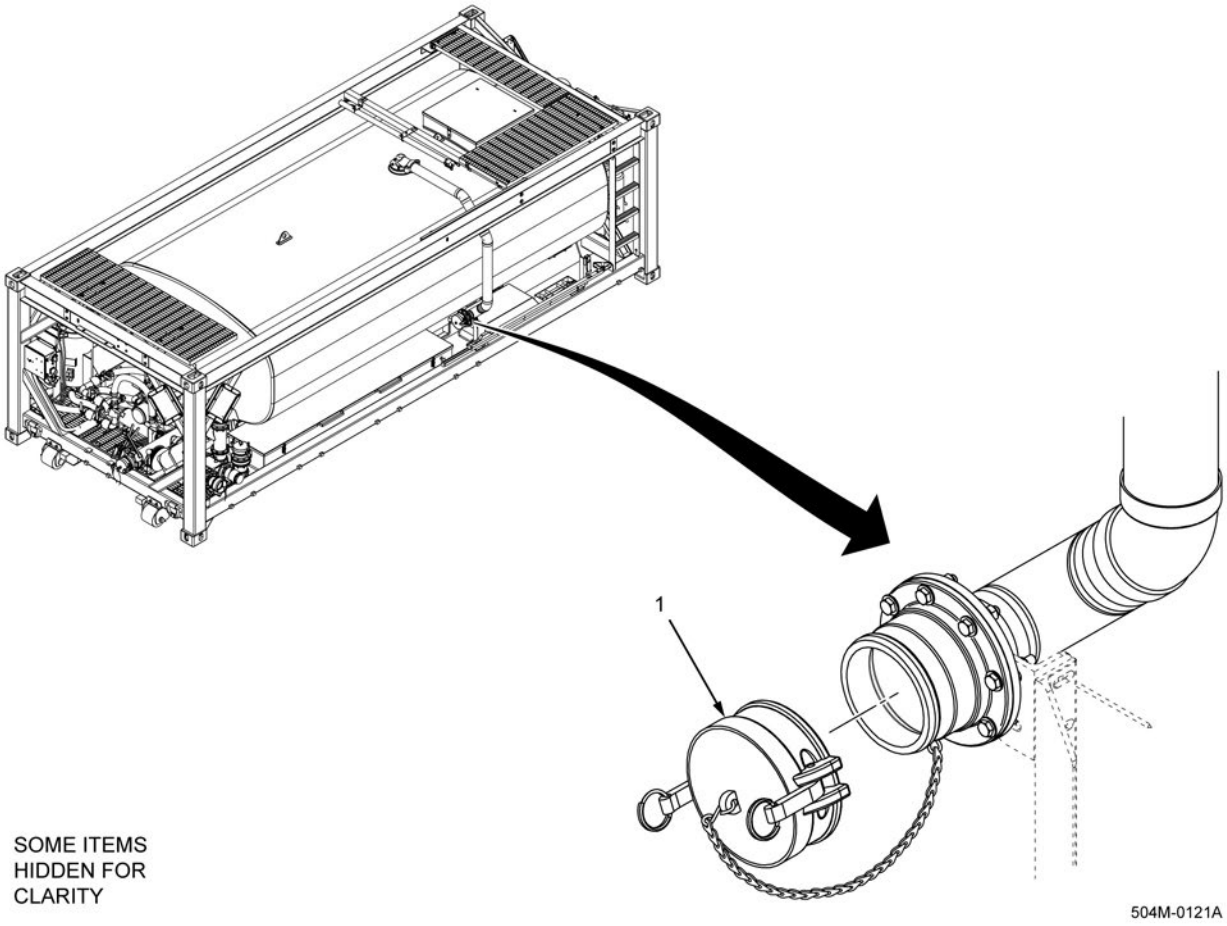


Figure 4. Installing Vapor Recovery Line Dust Cap.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Install (V14) ball valve placard (WP 0089).
2. Set up MFS TRM (TM 10-4930-371-10).
3. Check MFS TRM for leaks by recirculating fuel (TM 10-4930-371-10).

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
ADR STRAINER ASSEMBLY REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposable nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)
- Pan, drip (WP 0217, Table 1, Item 8)
- Pliers, multiple position (WP 0217, Table 1, Item 9)
- Vise, machinist's (WP 0217, Table 1, Item 14)
- Wire Brush (WP 0217, Table 1, Item 15)
- Wrench, adjustable, 15" (WP 0217, Table 1, Item 16)
- Wrench, internal pipe (WP 0217, Table 1, Item 18)
- Wrench, pipe, 18 inch (WP 0217, Table 1, Item 19)

Materials/Parts
- Absorbent material (WP 0216, Table 1, Item 1)
- Cable Tie (WP 0216, Table 1, Item 14)
- Cable Tie (WP 0216, Table 1, Item 8)
- Cleaning compound, solvent (WP 0216, Table 1, Item 3)
- Cloth, cleaning (WP 0216, Table 1, Item 4)
- Sealing compound (WP 0216, Table 1, Item 13)
- Thread sealing compound (WP 0216, Table 1, Item 15)

Materials/Parts (cont.)
- Gasket (WP 0150, Figure 4, Item 6)
- Nut, self locking, hexagon (LOCKNUT) (WP 0176, Figure 30, Item 16)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer (2)

References
- ATP 4-43
- TM 10-4930-371-10
- WP 0144.1

Equipment Condition
- MFS TRM grounded (TM 10-4930-371-10)
- MFS TRM shut down (TM 10-4930-371-10)
- MFS TRM drained (TM 10-4930-371-10)
- MFS TRM loaded on PLS trailer (TM 10-4930-371-10)

Time to Complete
- 4.0 Hour(s)

REMOVAL

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Failure to comply could result in injury or death to personnel.

1. Remove valve adapter assembly:
   a. Remove spring (Figure 1, Item 2) on bottom of valve adapter assembly (Figure 1, Item 3).
   b. Open levers (Figure 1, Item 1) and remove valve adapter assembly (Figure 1, Item 3).

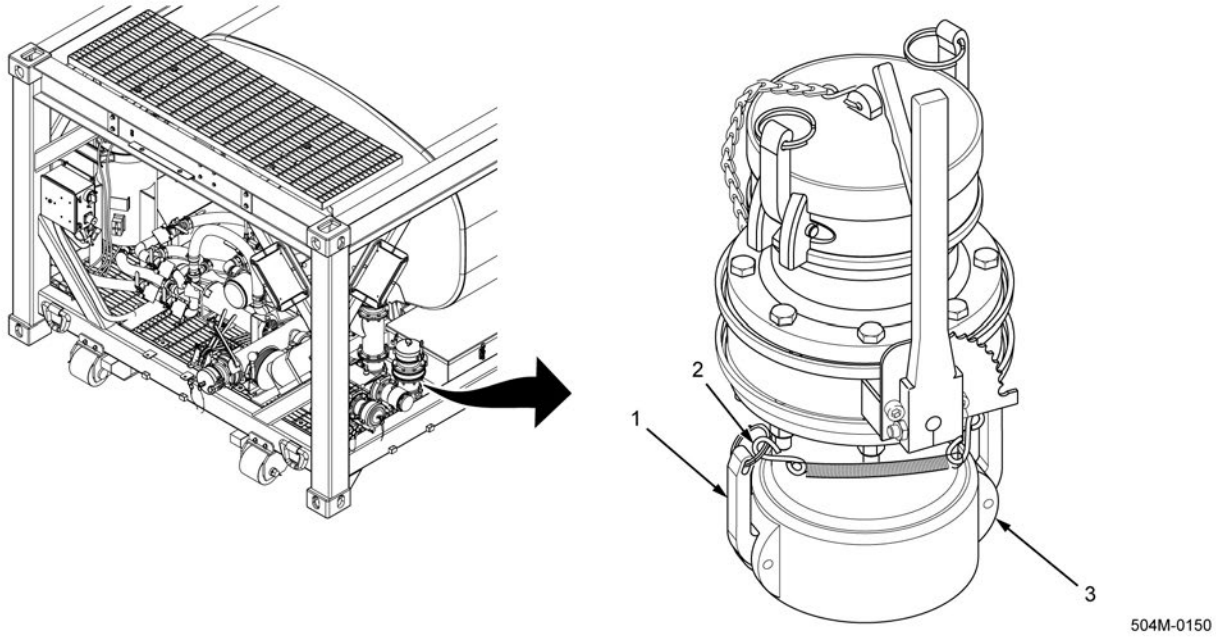


Figure 1. Valve Adapter Assembly Removal.

REMOVAL - Continued

2. Remove tee assembly:
   a. Remove spring (Figure 2, Item 2) on bottom of tee assembly (Figure 2, Item 3).
   b. Open levers (Figure 2, Item 1) and remove tee assembly (Figure 2, Item 3).

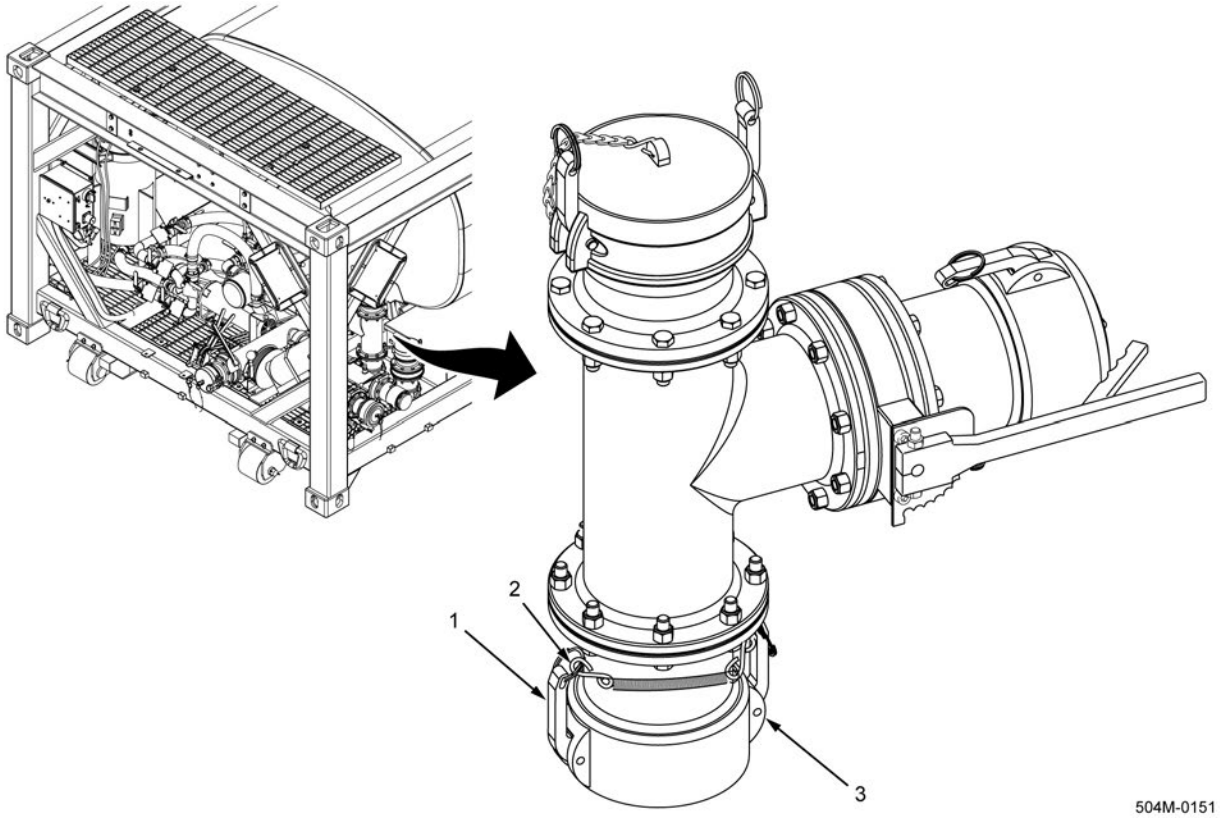


Figure 2. Tee Assembly Removal.

REMOVAL - Continued

3. Remove vapor recovery line dust cap (Figure 3, Item 2).
4. Momentarily open then close bottom loading valve (V1) (Figure 3, Item 1) to vent tank pressure.

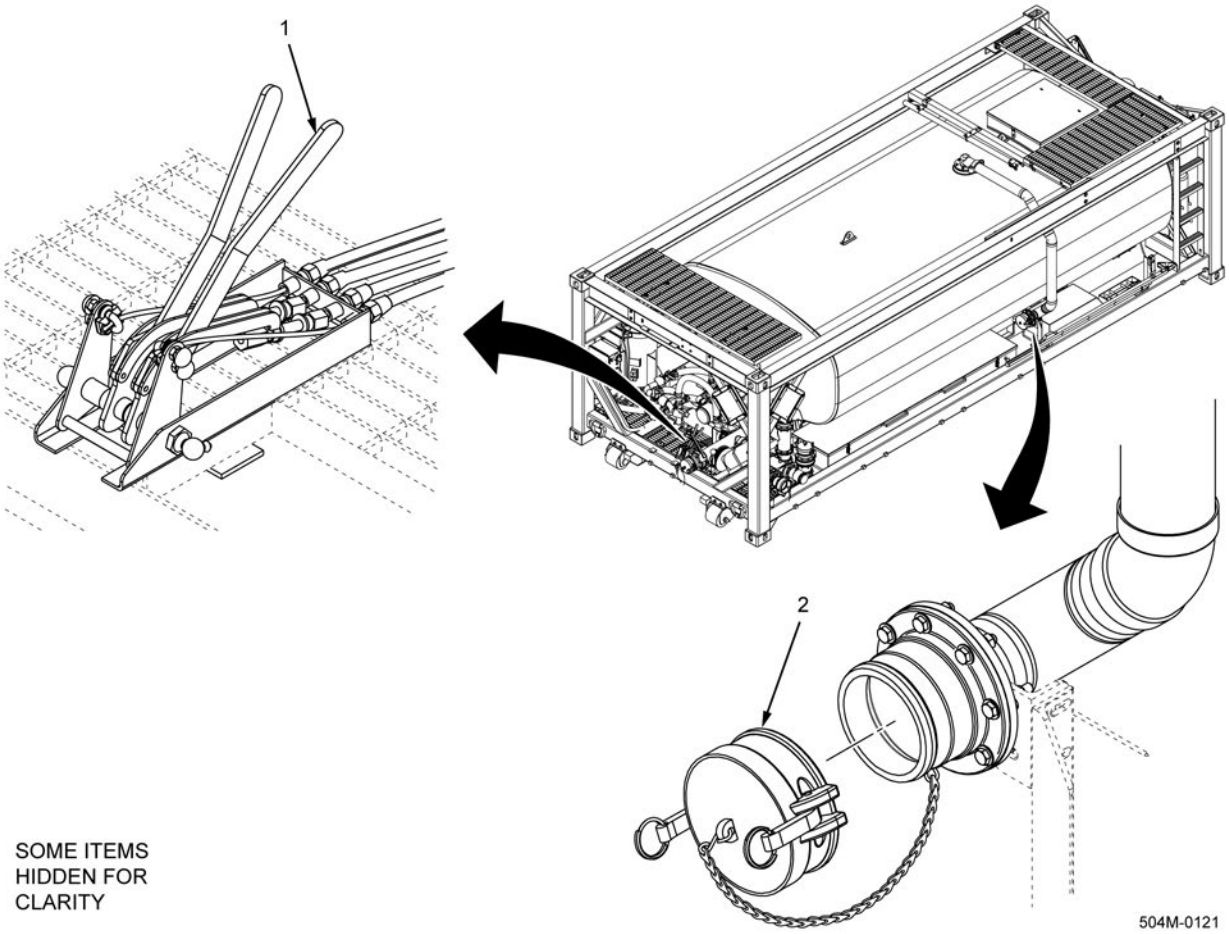


Figure 3. Fuel System Venting.

REMOVAL - Continued

WARNING

There will be residual fuel in piping, which may be under slight pressure which will be released in the following step. Take care to prevent fuel from being sprayed into face. Failure to comply may result in injury or death to personnel.

5. Place drip pan as close as possible under strainer assembly (Figure 4, Item 1) to catch residual fuel.
6. Loosen jam nut (Figure 4, Item 4).
7. Unscrew bolt (Figure 4, Item 3) enough to loosen yoke (Figure 4, Item 2) and cap (Figure 4, Item 5) and allow residual fuel to drain.
8. Tighten bolt (Figure 4, Item 3) after all fuel has been drained.

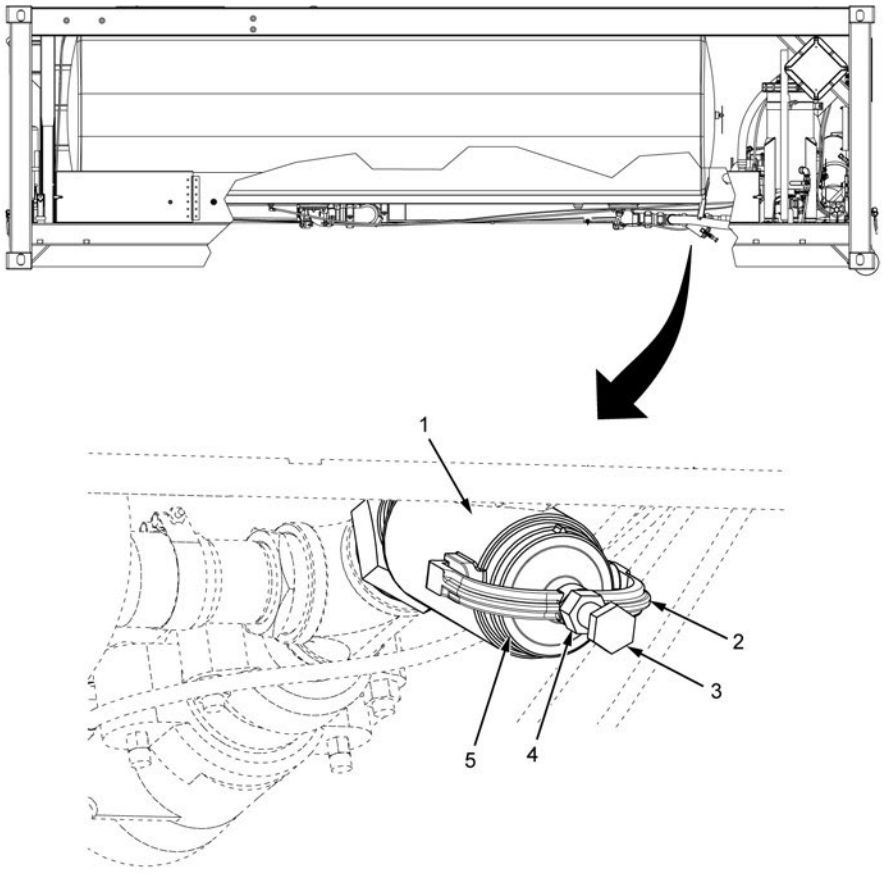


Figure 4. Draining Strainer.

REMOVAL - Continued

9. Place drip pan under strainer secondary manual shut off valve (V21) to catch residual fuel.
10. Remove clamp (Figure 5, Item 2) and flexible hose (Figure 5, Item 1) from hose barb (Figure 5, Item 3).

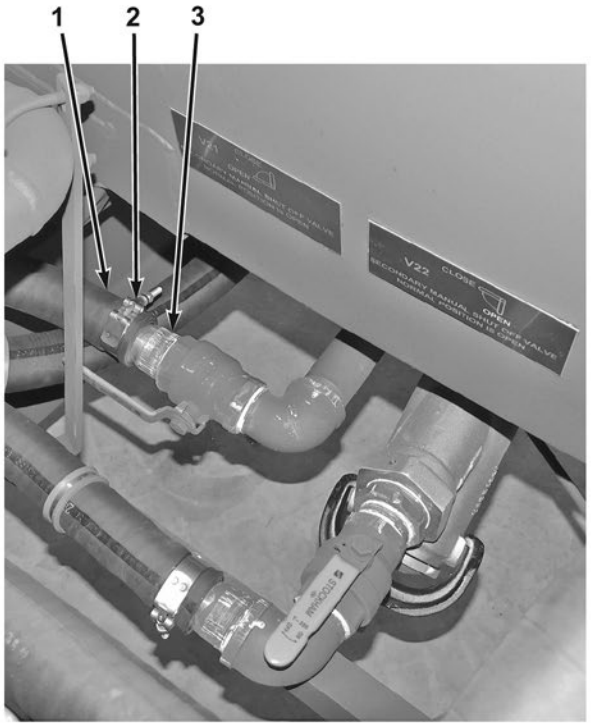


Figure 5. Removing Strainer Secondary Manual Shut Off Valve (V21) Hose.

REMOVAL - Continued

11. Place drip pan under strainer outlet ball valve (V22) to catch residual fuel.
12. Remove locknut (Figure 6, Item 4), flat washer (Figure 6, Item 5), bolt (Figure 6, Item 7), cushion clamp (Figure 6, Item 6), and flat washer (Figure 6, Item 5). Discard locknut.
13. Remove hose clamp (Figure 6, Item 2) and flexible hose (Figure 6, Item 1) from hose barb (Figure 6, Item 3).

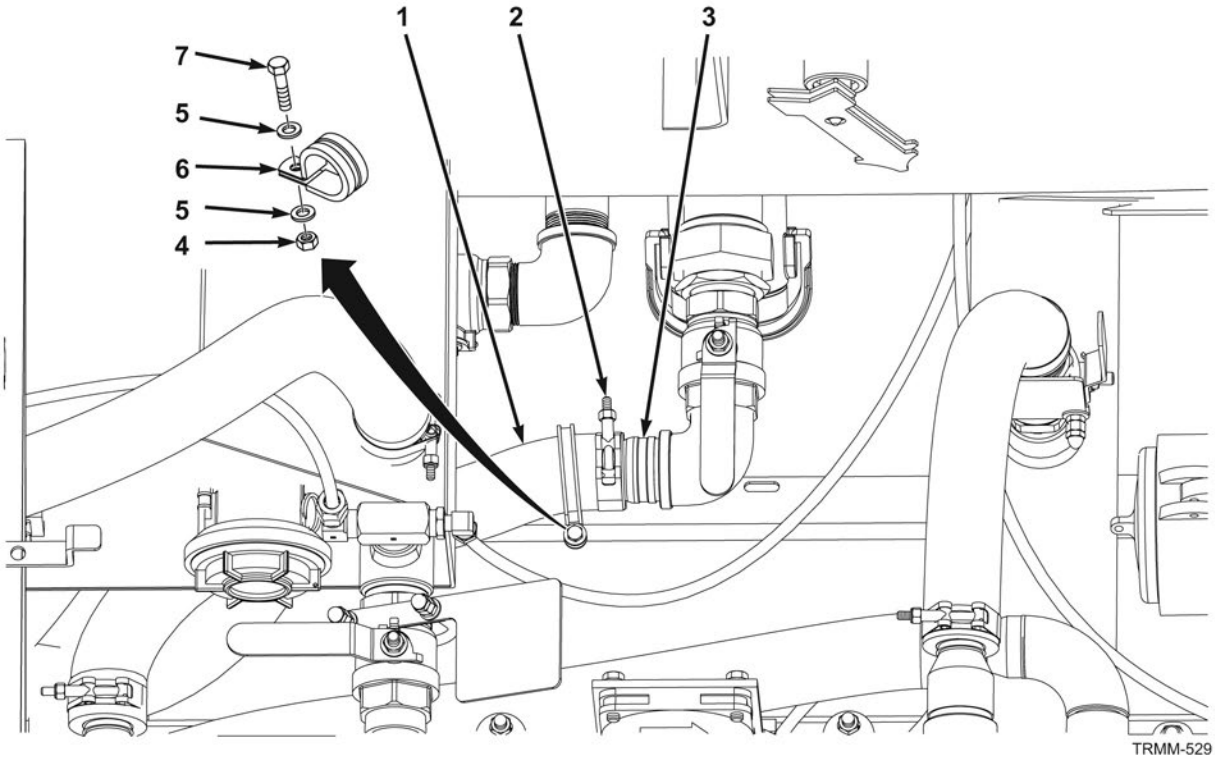


Figure 6. Removing Strainer Outlet Ball Valve (V22) Hose.

REMOVAL - Continued

NOTE

Strainer assembly and attached fittings must be supported during removal of coupling halves.

14. While supporting strainer assembly (Figure 7, Item 6), remove two bolts (Figure 7, Item 7), nuts (Figure 7, Item 2), and coupling halves (Figure 7, Item 3).
15. While supporting strainer assembly (Figure 7, Item 6), slide coupling gasket (Figure 7, Item 4) onto reducer (Figure 7, Item 1) and remove strainer assembly with pipe assembly (Figure 7, Item 5).
16. Remove and discard coupling gasket (Figure 7, Item 4).
17. Dispose of fuel IAW unit SOP.
18. Mark strainer assembly (Figure 7, Item 6) and pipe assembly (Figure 7, Item 5) to indicate proper alignment during installation.

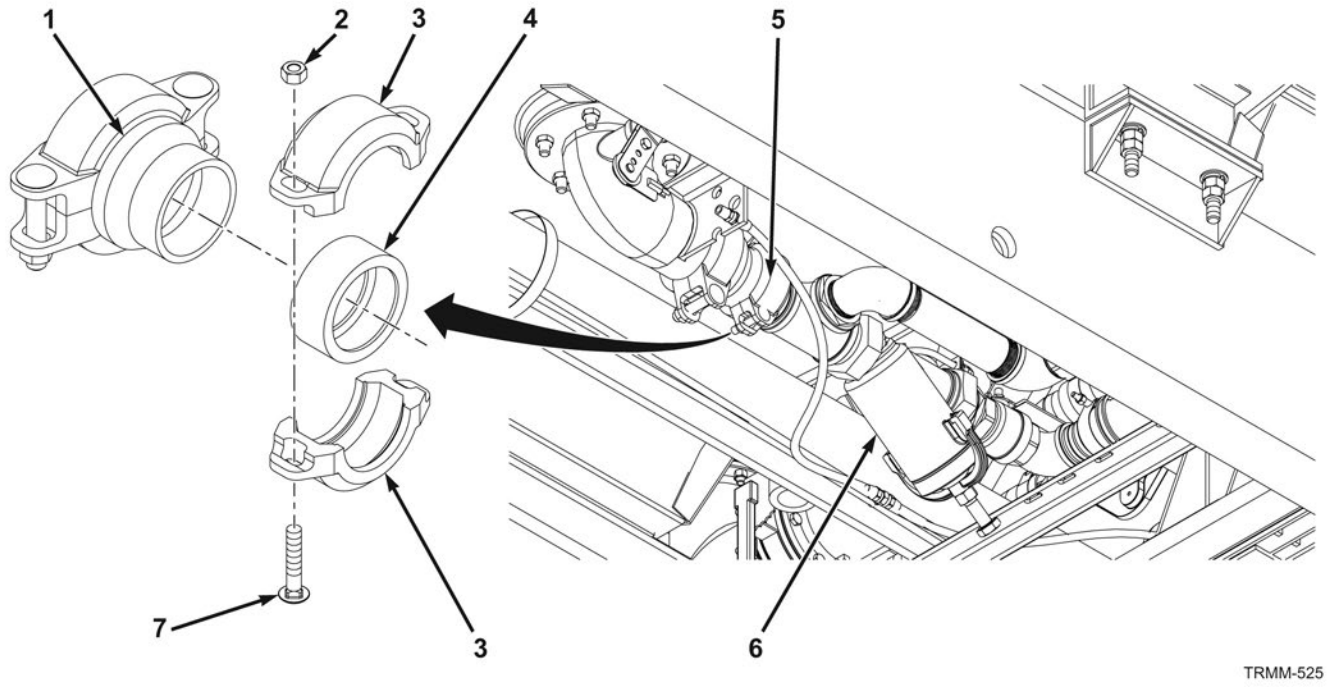


Figure 7. Removing Strainer Assembly.

END OF TASK

DISASSEMBLY

NOTE

Note all connections to aid in assembly.

1. Place strainer assembly in vise.
2. Remove TRM with ADR secondary manual shut off valves (V21 and V22). Refer to (WP 0144.1).
3. Remove nipple (Figure 8, Item 9) from bushing (Figure 8, Item 8).
4. Remove bushing (Figure 8, Item 8) from strainer assembly (Figure 8, Item 7).
5. Remove elbow (Figure 8, Item 10) from pipe (Figure 8, Item 1).
6. Remove pipe (Figure 8, Item 1) from elbow (Figure 8, Item 2).
7. Remove elbow (Figure 8, Item 2) from bushing (Figure 8, Item 3).
8. Remove bushing (Figure 8, Item 3) from tee (Figure 8, Item 5).
9. Remove nipple (Figure 8, Item 4) from tee (Figure 8, Item 5).
10. Remove tee (Figure 8, Item 5) from nipple (Figure 8, Item 6).
11. Remove nipple (Figure 8, Item 6) from strainer assembly (Figure 8, Item 7).

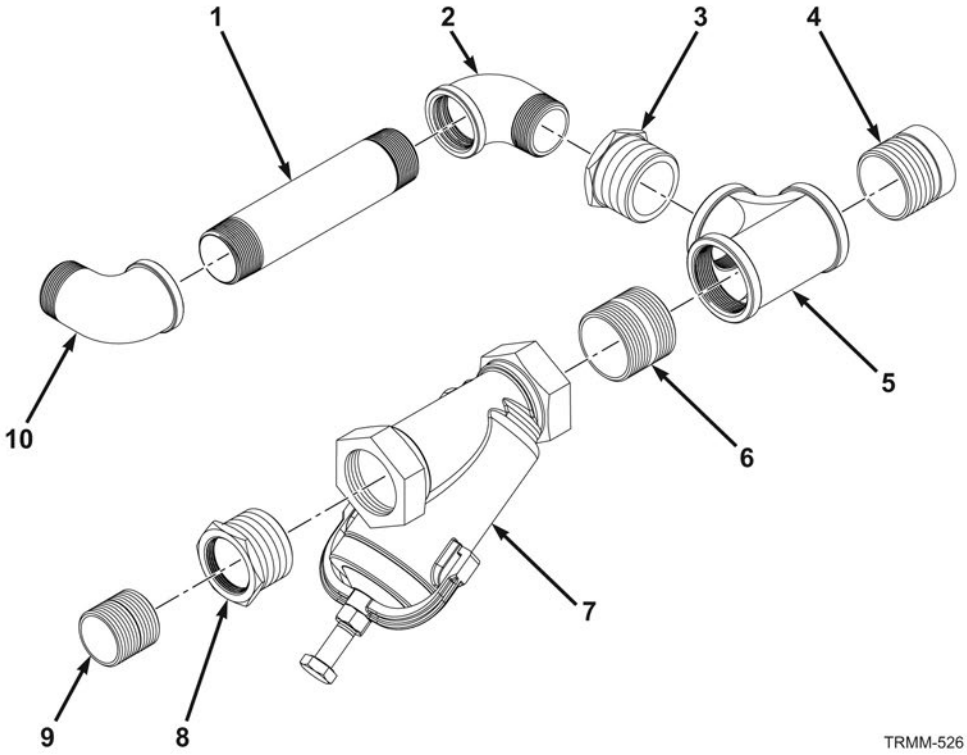


Figure 8. TRM With ADR Strainer Disassembly.

DISASSEMBLY - Continued

12. Disassemble strainer assembly to extent required to remove faulty components:
    a. Loosen jam nut (Figure 9, Item 6) and loosen bolt (Figure 9, Item 7) to release yoke (Figure 9, Item 5).
    b. Remove yoke (Figure 9, Item 5), cap (Figure 9, Item 4), and gasket (Figure 9, Item 3) from strainer body (Figure 9, Item 1).
    c. Remove strainer basket (Figure 9, Item 2) from strainer body (Figure 9, Item 1).
    d. Remove gasket (Figure 9, Item 3) from cap (Figure 9, Item 4). Discard gasket.
    e. Remove bolt (Figure 9, Item 7) and jam nut (Figure 9, Item 6) from yoke (Figure 9, Item 5).
    f. Remove jam nut (Figure 9, Item 6) from bolt (Figure 9, Item 7).

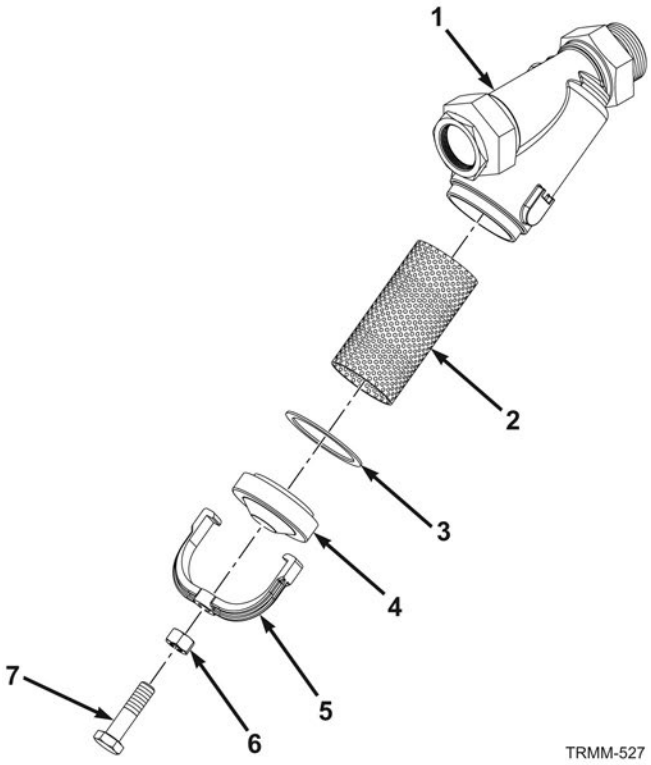


Figure 9. Strainer Disassembly.

END OF TASK

CLEANING

WARNING

Solvent cleaning compound MIL-PRF-680 Type III is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Keep away from open flames and other sources of ignition. Failure to comply may cause injury to personnel.

1. Clean any residual thread sealant from threads of all components.
2. Clean all metal parts with a cleaning cloth and solvent cleaning compound.
3. Allow parts to dry thoroughly.

END OF TASK

ASSEMBLY

WARNING

Thread sealing compound is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Failure to comply may cause injury to personnel.

1. Apply thread sealing compound to all threads.
2. Assemble strainer assembly:
   a. Install jam nut (Figure 10, Item 6) on bolt (Figure 10, Item 7). Thread jam nut (Figure 10, Item 6) all the way onto bolt (Figure 10, Item 7).
   b. Screw bolt (Figure 10, Item 7) into yoke (Figure 10, Item 5).
   c. Install new gasket (Figure 10, Item 3) on cap (Figure 10, Item 4).
   d. Install strainer basket (Figure 10, Item 2) in strainer body (Figure 10, Item 1).
   e. Place cap (Figure 10, Item 4) and yoke (Figure 10, Item 5) on strainer body (Figure 10, Item 1).
   f. Tighten bolt (Figure 10, Item 7) to secure yoke (Figure 10, Item 5) to cap (Figure 10, Item 4) on strainer body (Figure 10, Item 1).
   g. Tighten jam nut (Figure 10, Item 6) against yoke (Figure 10, Item 5) to secure cap (Figure 10, Item 4) on strainer body (Figure 10, Item 1).

ASSEMBLY - Continued

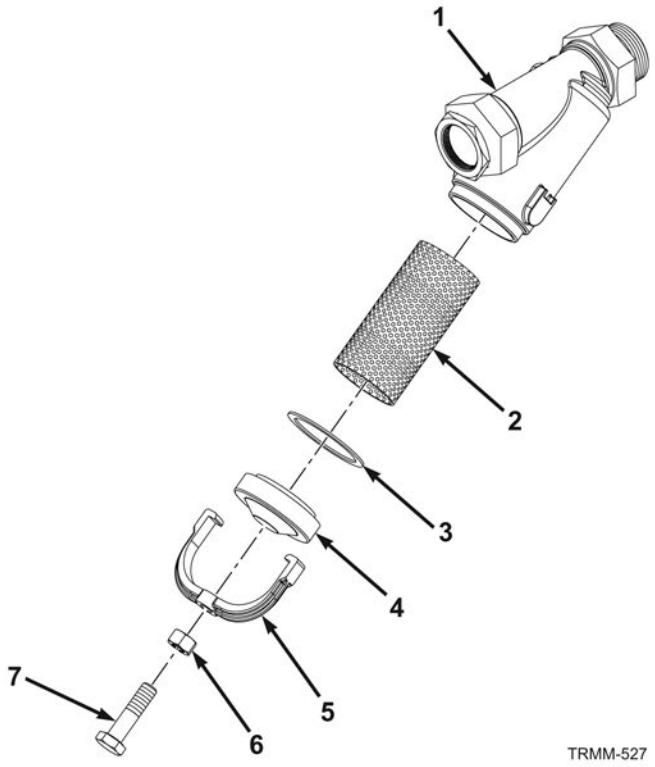


Figure 10. Strainer Assembly.

ASSEMBLY - Continued

3. Install nipple (Figure 11, Item 6) on strainer assembly (Figure 11, Item 7).
4. Install tee (Figure 11, Item 5) on nipple (Figure 11, Item 6).
5. Install nipple (Figure 11, Item 4) on tee (Figure 11, Item 5).
6. Install bushing (Figure 11, Item 3) on tee (Figure 11, Item 5).
7. Install elbow (Figure 11, Item 2) on bushing (Figure 11, Item 3).
8. Install pipe (Figure 11, Item 1) on elbow (Figure 11, Item 2).
9. Install elbow (Figure 11, Item 10) on pipe (Figure 11, Item 1).
10. Install bushing (Figure 11, Item 8) on strainer assembly (Figure 11, Item 7).
11. Install nipple (Figure 11, Item 9) on bushing (Figure 11, Item 8). Do not fully tighten nipple on bushing.
12. Install TRM with ADR secondary manual shut off valves (V21 and V22). Refer to (WP 0144.1).

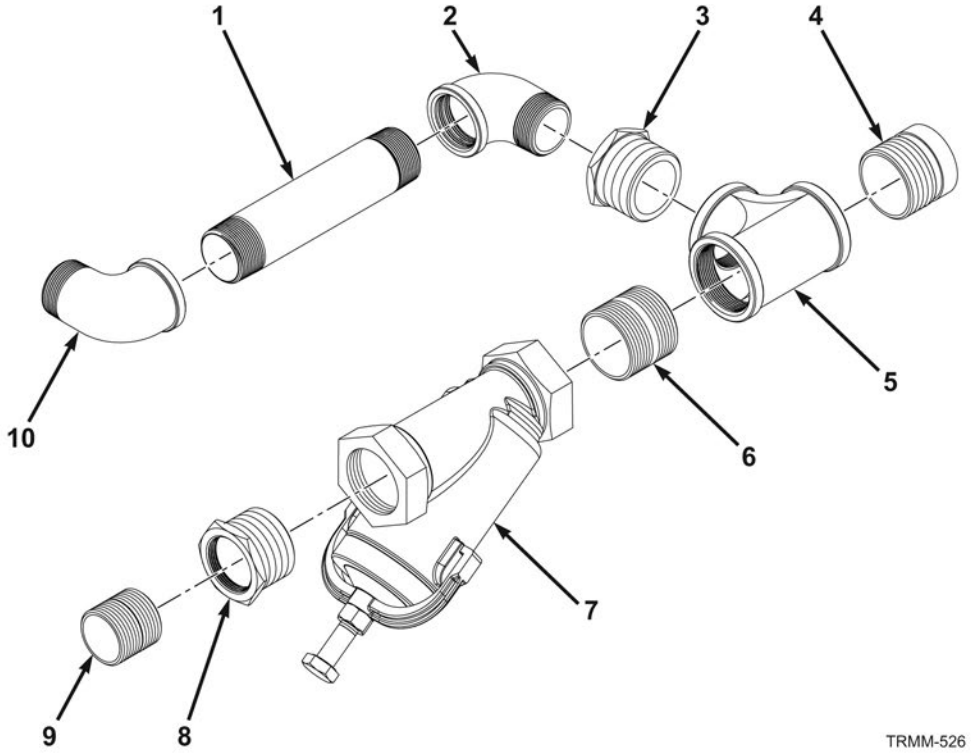


Figure 11. TRM With ADR Strainer Assembly.

END OF TASK

INSTALLATION

WARNING

Thread sealing compound is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Failure to comply may cause injury to personnel.

CAUTION

Once tightened, do not turn connections counterclockwise. Air leaks will be created and can cause leaks. Damage to equipment could occur.

1. Lightly lubricate new coupling gasket (Figure 12, Item 4) with fuel.
2. Install new coupling gasket (Figure 12, Item 4) on reducer (Figure 12, Item 1).

NOTE

Strainer assembly and assembled fittings must be supported during installation in the following steps.

3. Install entire strainer assembly (Figure 12, Item 6) and align with reducer (Figure 12, Item 1).
4. Slide new coupling gasket (Figure 12, Item 4) into place between reducer (Figure 12, Item 1) and pipe assembly (Figure 12, Item 5).
5. Install and loosely secure coupling halves (Figure 12, Item 3) on reducer (Figure 12, Item 1) and strainer assembly (Figure 12, Item 6) with two nuts (Figure 12, Item 2) and bolts (Figure 12, Item 7).
6. Ensure coupling gasket (Figure 12, Item 4) is in place and tighten two nuts (Figure 12, Item 2) and bolts (Figure 12, Item 7) until coupling halves (Figure 12, Item 3) are contacting each other on each side.

INSTALLATION - Continued

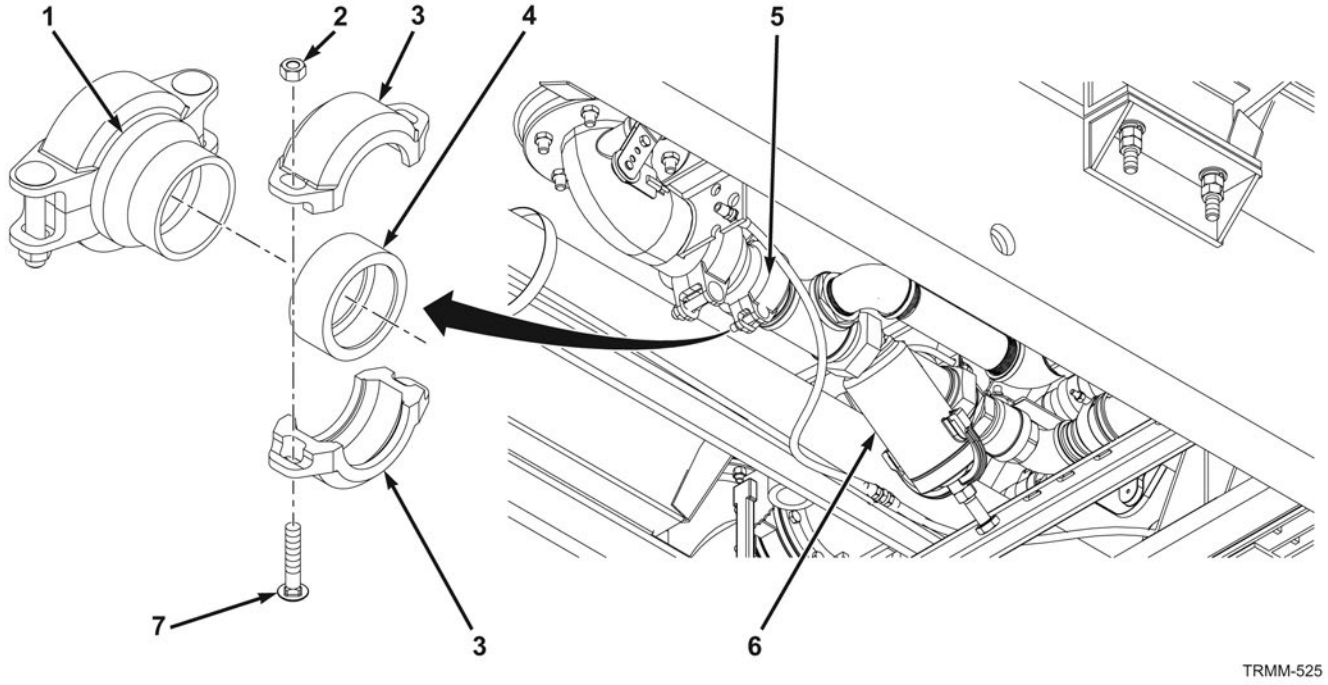


Figure 12. Installing Strainer Assembly.

INSTALLATION - Continued

7. Install flexible hose (Figure 13, Item 1) on hose barb (Figure 13, Item 3) with hose clamp (Figure 13, Item 2).
8. Secure flexible hose (Figure 13, Item 1) with cushion clamp (Figure 13, Item 6), flat washer (Figure 13, Item 5), bolt (Figure 13, Item 7), flat washer (Figure 13, Item 5), and new locknut (Figure 13, Item 4).

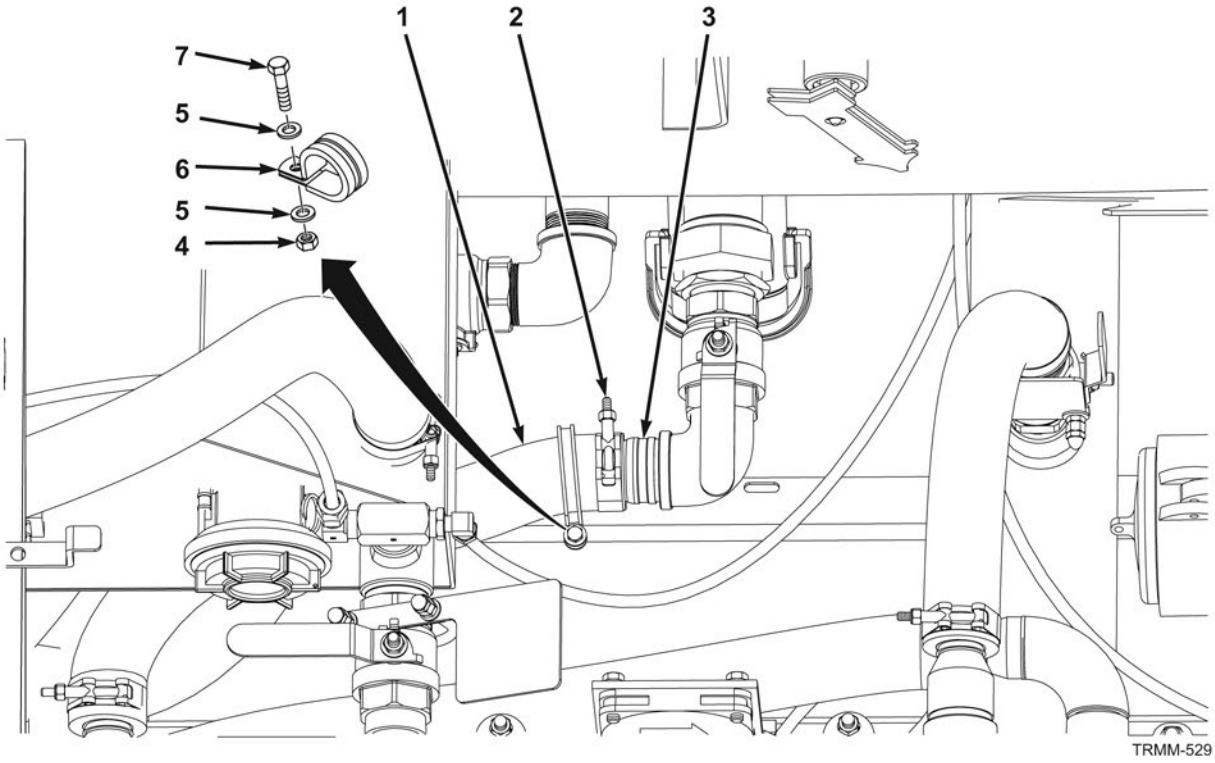


Figure 13. Installing Strainer Outlet Ball Valve (V22) Hose.

INSTALLATION - Continued

9. Install flexible hose (Figure 14, Item 1) on hose barb (Figure 14, Item 3) with clamp (Figure 14, Item 2).

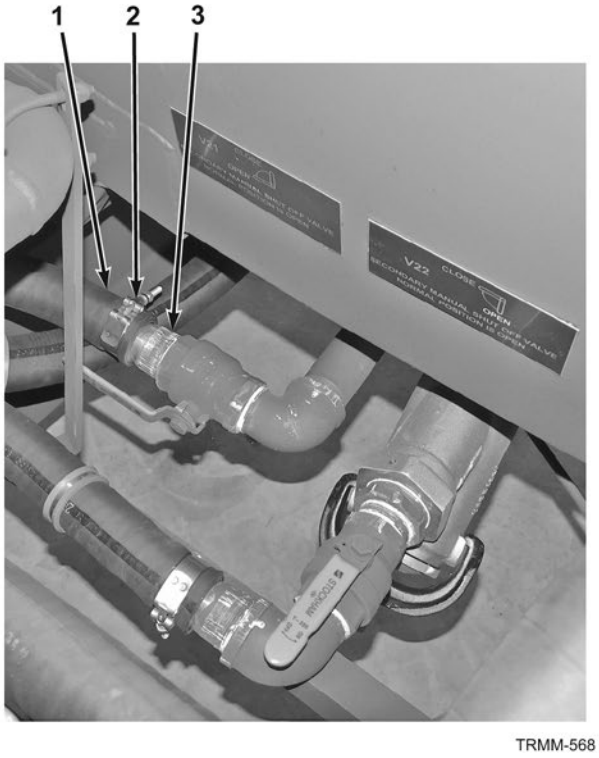


Figure 14. Installing Strainer Secondary Manual Shut Off Valve (V21) Hose.

INSTALLATION - Continued

10. Install tee assembly:
    a. Install tee assembly (Figure 15, Item 3).
    b. Install spring (Figure 15, Item 2) on bottom of tee assembly (Figure 15, Item 3) and close levers (Figure 15, Item 1).

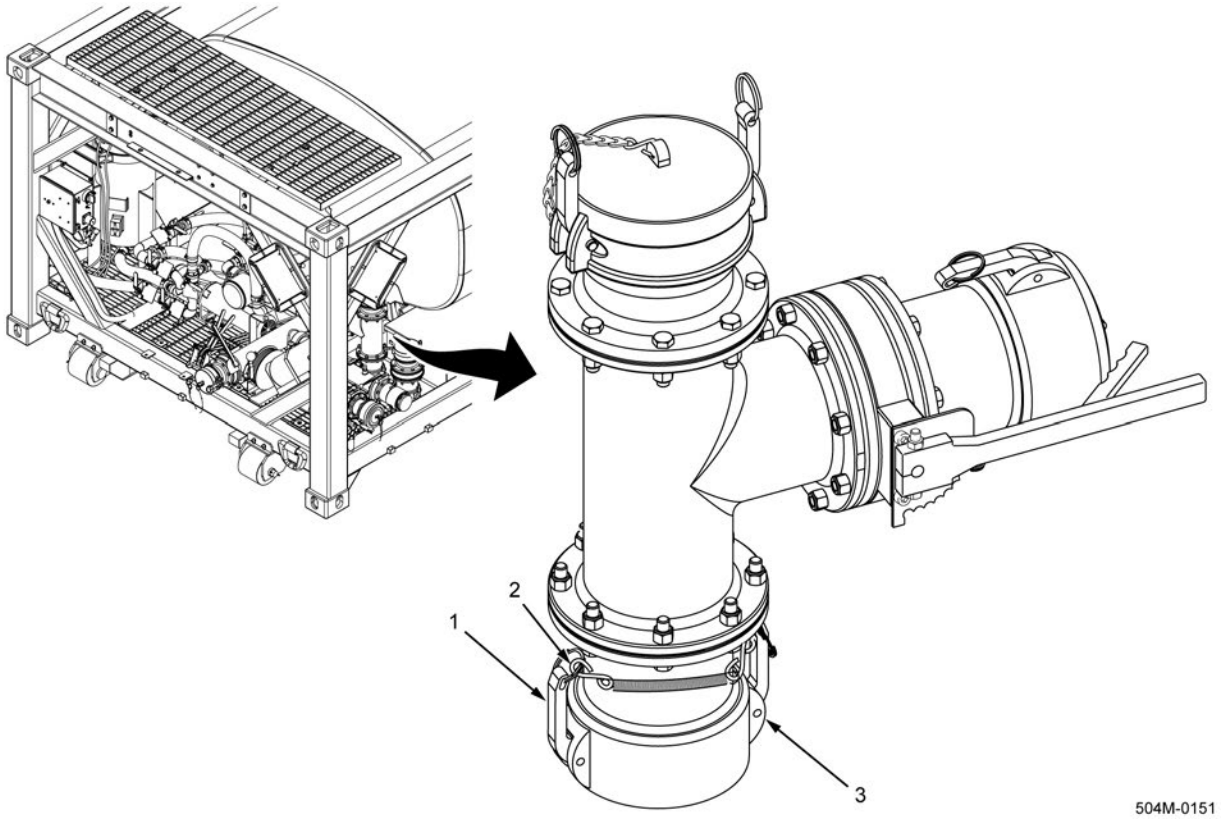


Figure 15. Tee Assembly Installation.

INSTALLATION - Continued

11. Install valve adapter assembly:
    a. Install valve adapter assembly (Figure 16, Item 3).
    b. Install spring (Figure 16, Item 2) on bottom of valve adapter assembly (Figure 16, Item 3) and close levers (Figure 16, Item 1).

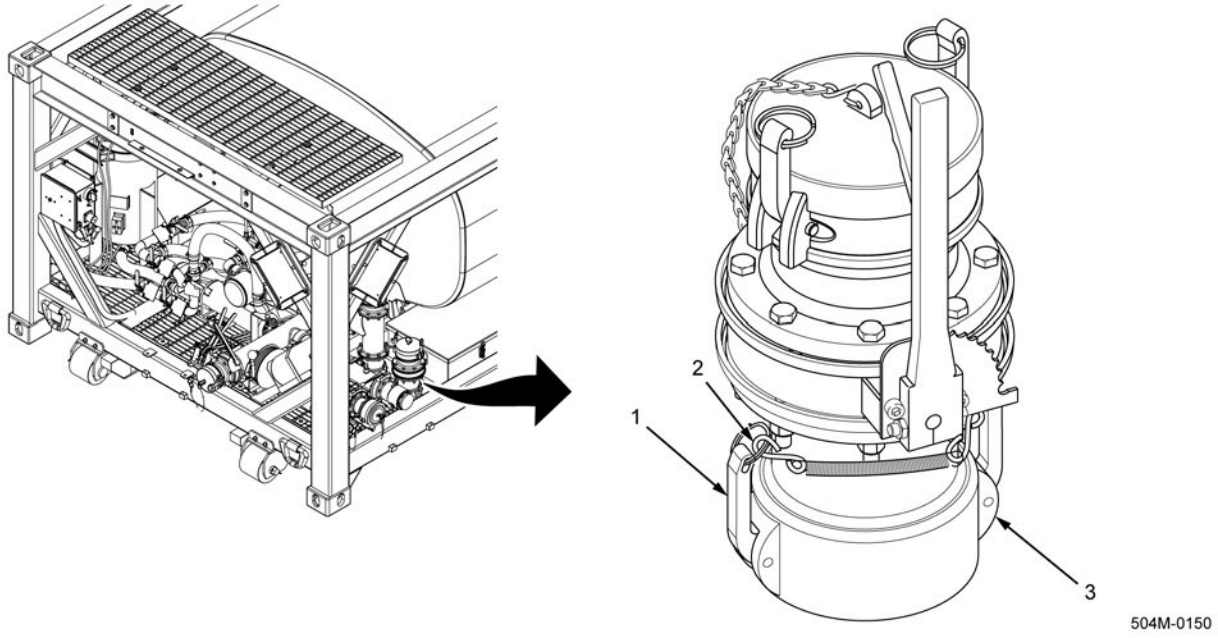


Figure 16. Valve Adapter Assembly Installation.

INSTALLATION - Continued

12. Install vapor recovery line dust cap (Figure 17, Item 1).

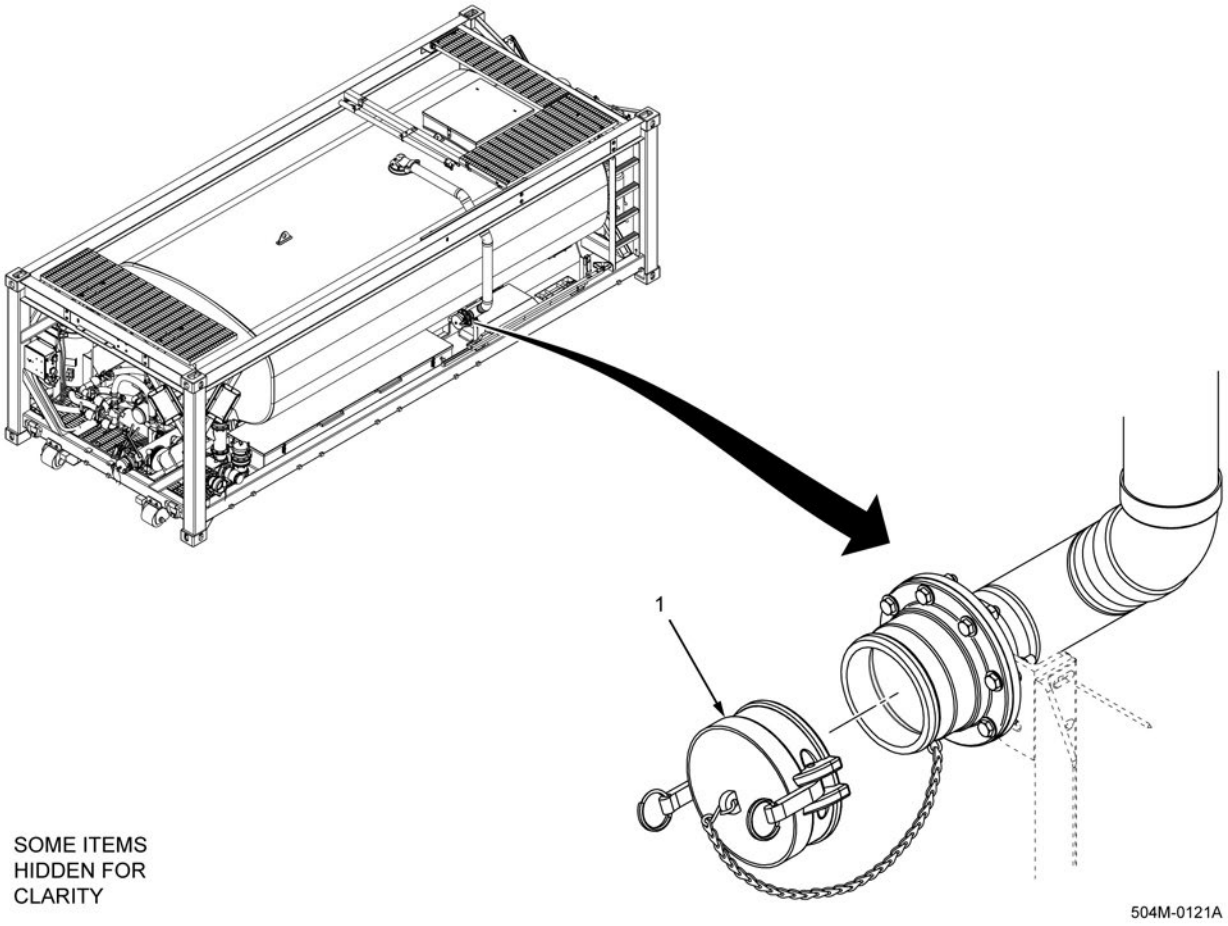


Figure 17. Installing Vapor Recovery Line Dust Cap.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Set up MFS TRM (TM 10-4930-371-10).
2. Check MFS TRM for leaks by recirculating fuel (TM 10-4930-371-10).

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
ADR CHECK VALVE (V20) REPLACEMENT

INITIAL SETUP:

Tools and Special Tools
- Tool kit, general mechanic's (WP 0217, Table 1, Item 13)
- Fire extinguisher (TM 10-4930-371-10)
- Gloves, disposable nitrile (WP 0216, Table 1, Item 5)
- Goggles, industrial (WP 0216, Table 1, Item 6)
- Pan, drip (WP 0217, Table 1, Item 8)
- Wrench, adjustable, automotive (WP 0217, Table 1, Item 17)
- Wrench, internal pipe (WP 0217, Table 1, Item 18)
- Wrench, pipe, 18 inch (WP 0217, Table 1, Item 19)
- Vise, machinist's (WP 0217, Table 1, Item 14)

Materials/Parts
- Absorbent material (WP 0216, Table 1, Item 1)
- Cleaning compound, solvent (WP 0216, Table 1, Item 3)
- Cloth, cleaning (WP 0216, Table 1, Item 4)
- Thread sealing compound (WP 0216, Table 1, Item 15)
- Valve, check, hose evacuation (V20) (WP 0209.1, Figure 63.1, Item 13)

Personnel Required
- 91J Quartermaster and Chemical Equipment Repairer

References
- ATP 4-43
- TM 10-4930-371-10

Equipment Condition
- MFS TRM loaded on LHS (TM 10-4930-371-10)
- MFS TRM grounded (TM 10-4930-371-10)
- MFS TRM shut down (TM 10-4930-371-10)
- MFS TRM drained (TM 10-4930-371-10)

Time to Complete
- 0.5 Hour(s)

REMOVAL

1. Remove vapor recovery line dust cap (Figure 1, Item 2).
2. Momentarily open then close bottom loading valve (V1) (Figure 1, Item 1) to vent tank pressure.

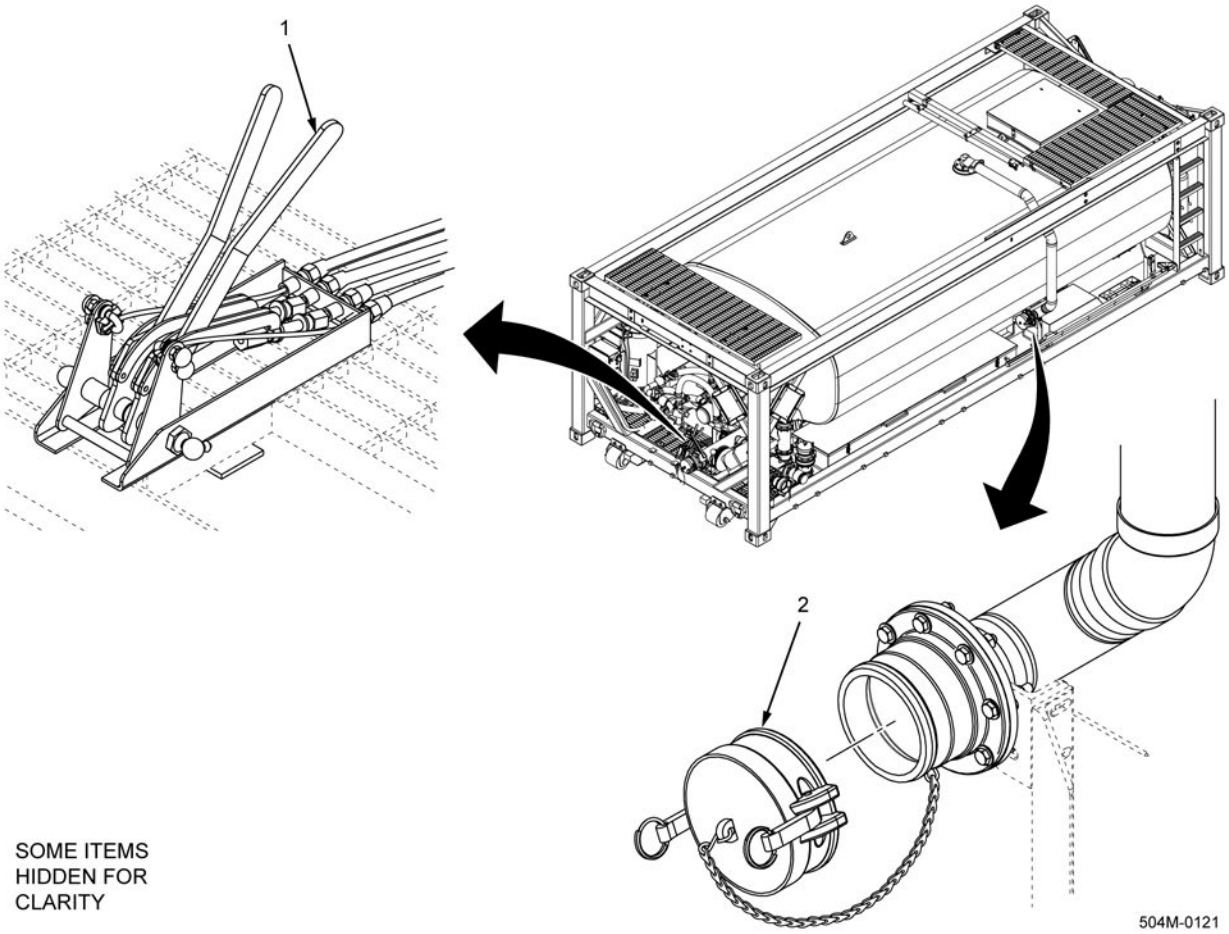


Figure 1. Fuel System Venting.

REMOVAL - Continued

WARNING

- Fuel is toxic and can severely affect skin, eyes and the respiratory tract. Personnel must wear appropriate hand and eye protection IAW ATP 4-43. Wash skin thoroughly with soap and water if exposed. In case of contact with fuel, flush eyes with clear water for at least 15 minutes. Catch residual fuel with a drip pan. Spills can create slip and fire hazards. Clean up fuel spills immediately. Ensure to dispose of fuel laden rags or absorbent materials according to unit hazardous waste disposal procedures keeping away from open flame or ignition sources.
- Do not smoke, use open flame, make sparks, or create other ignition sources around fuel. Avoid contact with eyes and skin. Avoid prolonged or repeated breathing of vapors and ensure there is adequate ventilation. Always have a fire extinguisher on the ground next to the MFS TRM prior to the transfer of fuel.
- Failure to comply could result in injury or death to personnel.

3. Place drip pan under check valve to catch residual fuel.
4. Remove clamp (Figure 2, Item 6) and flexible hose (Figure 2, Item 7) from hose barb (Figure 2, Item 5).

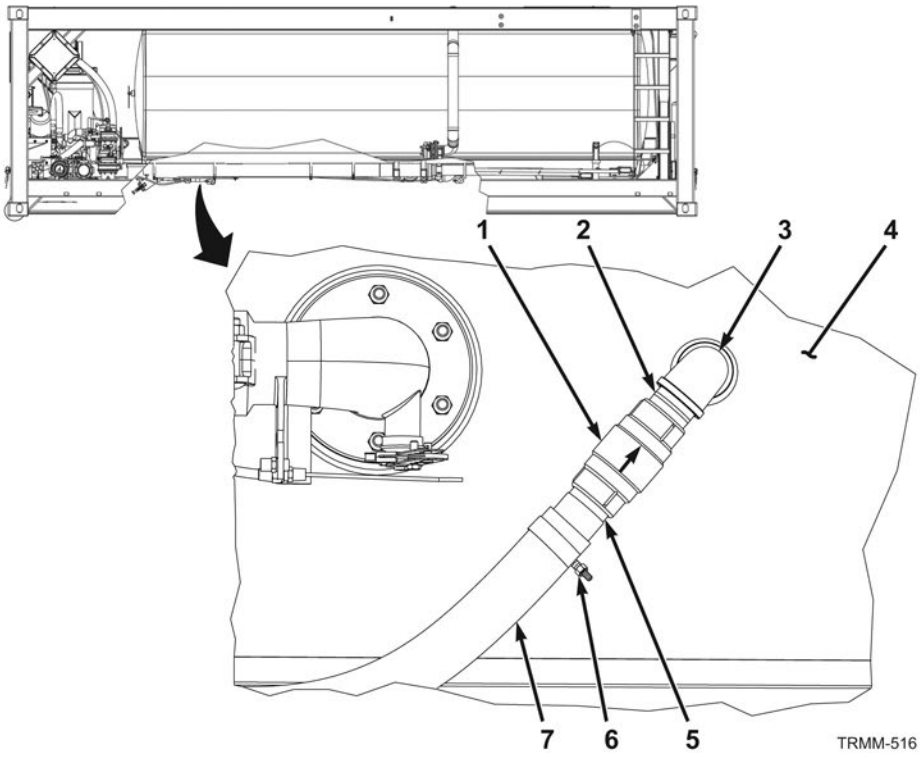


Figure 2. Removing Hose Evacuation Check Valve V20.

REMOVAL - Continued

NOTE

- Note orientation of hose evacuation check valve (V20) prior to removal to ensure proper installation.
- Arrow embossed on hose evacuation check valve (V20) must point toward tank (Figure 2, Item 4).

5. Remove hose evacuation check valve (V20) (Figure 2, Item 1) and nipple (Figure 2, Item 2) from elbow (Figure 2, Item 3).
6. Remove hose barb (Figure 2, Item 5) from hose evacuation check valve (V20) (Figure 2, Item 1).
7. Remove nipple (Figure 2, Item 2) from hose evacuation check valve (V20) (Figure 2, Item 1).
8. Remove drip pan and dispose of fuel IAW unit SOP.
9. Clean parts in accordance with CLEANING task in this work package.

END OF TASK

CLEANING

WARNING

Solvent cleaning compound MIL-PRF-680 Type III is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Keep away from open flames and other sources of ignition. Failure to comply may cause injury to personnel.

1. Clean all metal parts with a cleaning cloth and solvent cleaning compound.
2. Clean threads of all disassembled components. Remove all buildup of dirt, oil, and debris from threads.
3. Allow parts to dry thoroughly.

END OF TASK

INSTALLATION

WARNING

Thread sealing compound is an environmentally compliant and low toxic material. However, it may be irritating to the eyes and skin. Use protective gloves and goggles. Use in well-ventilated areas. Failure to comply may cause injury to personnel.

CAUTION

Once tightened, do not turn connections counterclockwise. Air leaks will be created and can cause leaks. Damage to equipment could occur.

1. Apply thread sealing compound to all threads.

NOTE

- Ensure hose evacuation check valve (V20) is installed as noted prior to removal.
- Arrow embossed on hose evacuation check valve (V20) must point toward tank (Figure 3, Item 4).

2. Install nipple (Figure 3, Item 2) on hose evacuation check valve (V20) (Figure 3, Item 1).

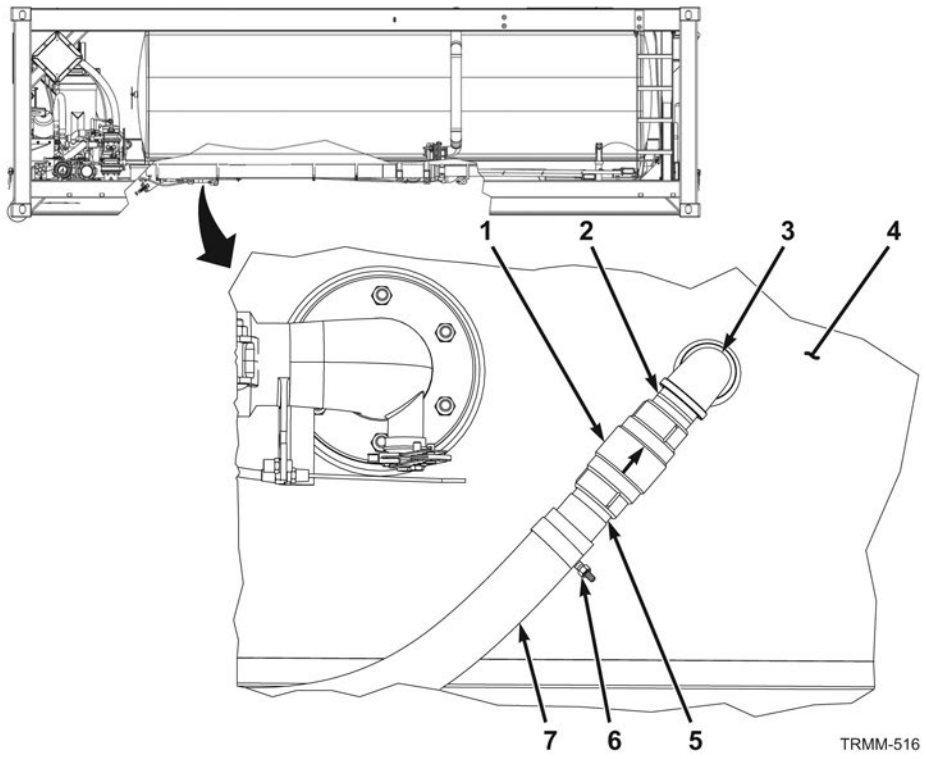


Figure 3. Installing Hose Evacuation Check Valve (V20).

INSTALLATION - Continued

3. Install hose barb (Figure 3, Item 5) on hose evacuation check valve (V20) (Figure 3, Item 1).
4. Install nipple (Figure 3, Item 2) and hose evacuation check valve (V20) (Figure 3, Item 1) on elbow (Figure 3, Item 3).
5. Install flexible hose (Figure 3, Item 7) on hose barb (Figure 3, Item 5) with clamp (Figure 3, Item 6).
6. Install vapor recovery line dust cap (Figure 4, Item 1).

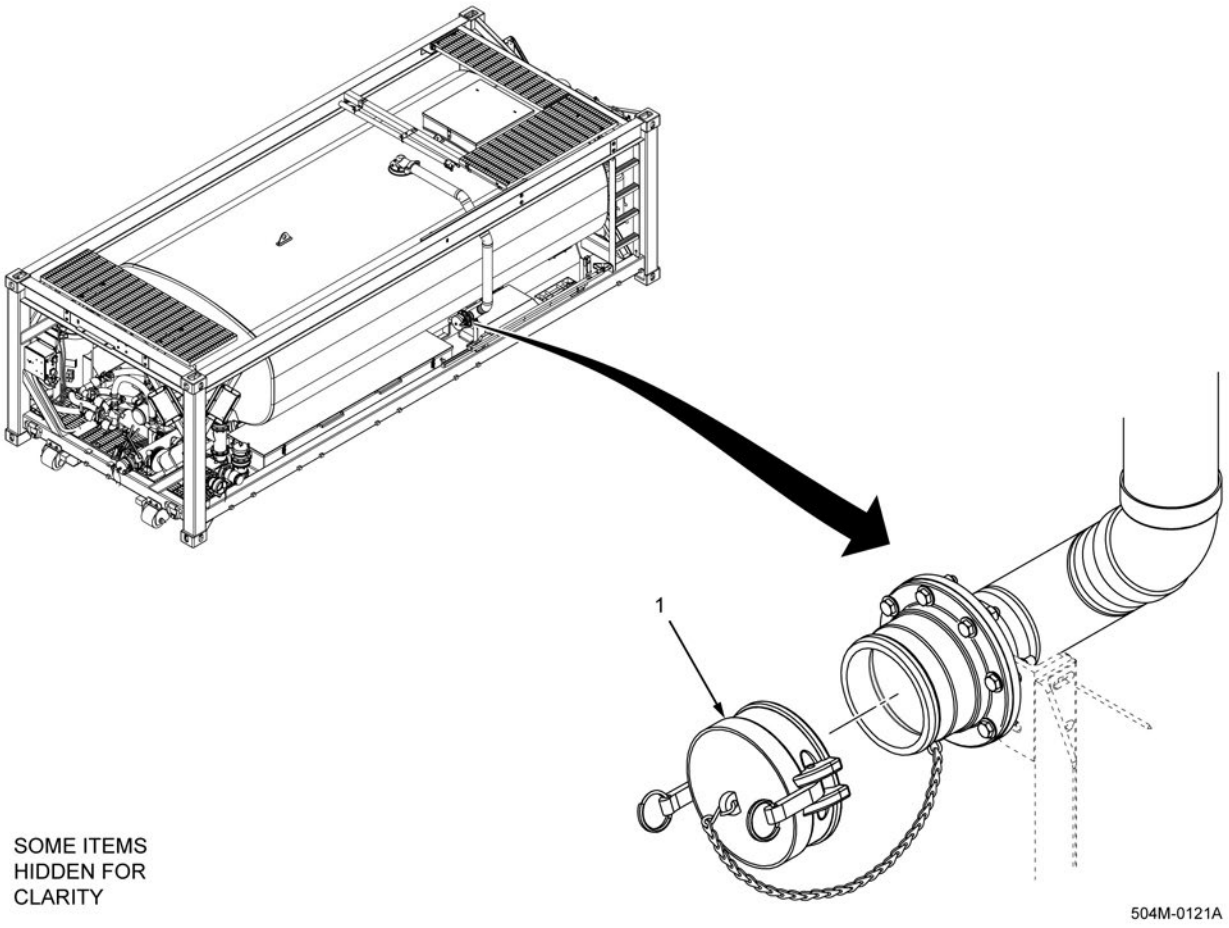


Figure 4. Installing Vapor Recovery Line Dust Cap.

END OF TASK

FOLLOW-ON MAINTENANCE

1. Set up the TRM (TM 10-4930-371-10).
2. Check the TRM for leaks by recirculating fuel (TM 10-4930-371-10).

END OF TASK

END OF WORK PACKAGE

MAINTAINER MAINTENANCE
TORQUE LIMITS

WHEN TO USE TORQUE LIMITS

When a torque is not specified in an individual work package, use the procedures in this work package to determine proper torque limits and use of adapters with torque wrenches.

WHEN TO USE ADAPTERS WITH TORQUE WRENCHES

When an adapter is necessary due to space or type of fitting being torqued, it must be determined how the adapter changes the amount of force applied. If the adapter increases or decreases the distance from the drive of the torque wrench to the fitting being torqued, an equation must be used to compensate for the difference.

HOW TO USE ADAPTERS WITH TORQUE WRENCHES

NOTE

The following abbreviations apply to the below procedures:

AL = Adapter Length

AT = Applied Torque

DT = Desired Torque

LT = Length of Torque Wrench

1. If the adapter used decreases the distance between the center of the torque wrench handle and the center of the drive, first find the desired torque for the fitting, then calculate as follows:
   a. Multiply DT by LT.
   b. Subtract AL from LT.
   c. Divide the first answer by the second answer to find AT.
2. If the adapter used increases the distance between the center of the torque wrench handle and the center of the drive, first find the desired torque for the fitting, then calculate as follows:
   a. Multiply DT by LT.
   b. Add AL and LT.
   c. Divide the first answer by the second answer to find AT.

HOW TO USE TORQUE TABLES

NOTE

To determine the proper torque limit of a nut, use the steps that follow for the corresponding bolt or stud.

1. Measure the diameter of the bolt to be torqued.
2. For Society of Automotive Engineers (SAE) fasteners, determine the threads per inch by counting the threads. For metric fasteners, determine the thread pitch using a thread pitch gage.
3. Determine the grade (SAE) or class (metric) of the bolt you are torquing by comparing the markings on the head of the bolt with the figures in Table 1, Table 2, Table 3 or Table 4 for SAE fasteners, or Table 5, Table 6, Table 7 or Table 8 for metric fasteners.

HOW TO USE TORQUE TABLES - Continued

4. Determine if the torque limit applies to wet or dry torque as follows:
   a. Wet torque is any bolt that is lubricated or coated with an antiseize compound.
   b. Dry torque is any bolt that is not lubricated or coated with an antiseize compound.
5. Locate the proper torque limit for the bolt to be torqued in the applicable table:
   a. Select the applicable table based on whether the torque limit applies to wet or dry torque, the bolt is SAE or metric and, for metric fasteners, the fastener class:

      Table 1. Dry Torque Limits for SAE Standard Torque, 1/4” – 1/2” (SAE Grades 2, 5 and 8)

      Table 2. Dry Torque Limits for SAE Standard Torque, 9/16” – 1” (SAE Grades 2, 5 and 8)

      Table 3. Wet Torque Limits for SAE Standard Torque, 1/4” – 1/2” (SAE Grades 2, 5 and 8)

      Table 4. Wet Torque Limits for SAE Standard Torque, 9/16” – 1” (SAE Grades 2, 5 and 8)

      Table 5. Dry Torque Limits for Metric Standard Torque, 3mm – 14mm (Class 4.6, 4.8 and 5.8

      Table 6. Dry Torque Limits for Metric Standard Torque, 8mm – 36mm (Class 8.8, 9.8 and 10.9)

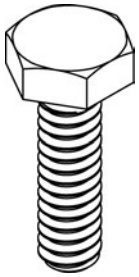
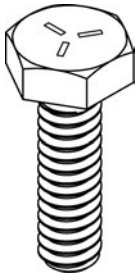
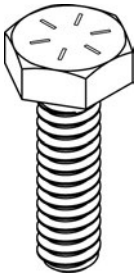
      Table 7. Wet Torque Limits for Metric Standard Torque, 3mm – 14mm (Class 4.6, 4.8 and 5.8)

      Table 8. Wet Torque Limits for Metric Standard Torque, 8mm – 36mm (Class 8.8, 9.8 and 10.9)

   b. Locate the row(s) that list the bolt diameter.
   c. Select the row that lists the threads per inch (SAE) or the thread pitch (metric) that corresponds to the bolt diameter.
   d. Select the columns that apply to the bolt grade (SAE) or class (metric).
   e. Locate the proper torque limit by where the selected row (bolt diameter and threads per inch or thread pitch) intersects with the selected columns (bolt grade or class).

HOW TO USE TORQUE TABLES - Continued

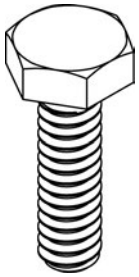
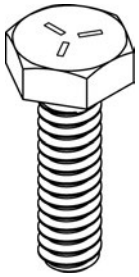
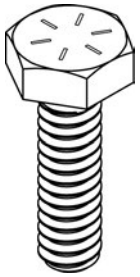
Table 1. Dry Torque Limits for SAE Standard Torque, 1/4" – 1/2" (SAE Grades 2, 5 and 8)

	Material Grade Markings		
	 **Figure 1. SAE Grade 2.**	 **Figure 2. SAE Grade 5.**	 **Figure 3. SAE Grade 8.**

Diameter	Threads Per Inch	Torque					
inch		in-lbs	N·m	in-lbs	N·m	in-lbs	N·m
1/4	20	66	7.46	101	11.41	143	16.16
1/4	28	75	8.48	116	13.11	164	18.53
5/16	18	135	15.26	209	23.62	295	33.34
5/16	24	150	16.95	230	25.99	327	36.95
3/8	16	240	27.12	370	41.81	523	59.1
3/8	24	272	30.74	420	47.46	593	67.01
7/16	14	384	43.39	593	67.01	837	94.58
7/16	20	428	48.36	662	74.81	935	105.66
1/2	13	585	66.11	904	102.15	1277	144.30
1/2	20	660	74.58	1020	115.26	1440	162.72

HOW TO USE TORQUE TABLES - Continued

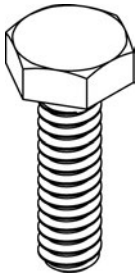
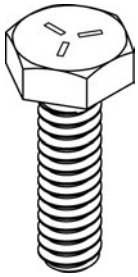
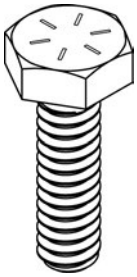
Table 2. Dry Torque Limits for SAE Standard Torque, 9/16" – 1" (SAE Grades 2, 5 and 8)

	Material Grade Markings		
	 Figure 4. SAE Grade 2.	 Figure 5. SAE Grade 5.	 Figure 6. SAE Grade 8.

Diameter	Threads Per Inch	Torque					
inch		ft-lbs	N·m	ft-lbs	N·m	ft-lbs	N·m
9/16	12	70	94.92	109	147.80	154	208.82
9/16	18	78	105.77	121	164.08	171	231.88
5/8	11	97	131.53	150	203.40	212	287.47
5/8	18	110	149.16	170	230.52	240	325.44
3/4	10	172	233.23	269	364.76	376	509.86
3/4	16	192	260.35	297	402.73	420	569.52
1	8	—	—	644	873.26	909	1232.60
1	12	—	—	704	954.62	995	1349.22

HOW TO USE TORQUE TABLES - Continued

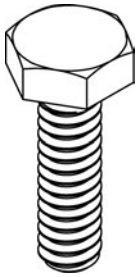
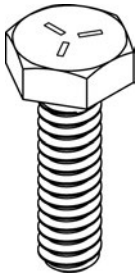
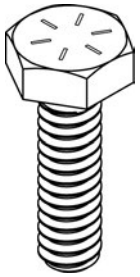
Table 3. Wet Torque Limits for SAE Standard Torque, 1/4" – 1/2" (SAE Grades 2, 5 and 8)

	Material Grade Markings		
	 Figure 7. SAE Grade 2.	 Figure 8. SAE Grade 5.	 Figure 9. SAE Grade 8.

Diameter	Threads Per Inch	Torque					
inch		in-lbs	N·m	in-lbs	N·m	in-lbs	N·m
1/4	20	49	5.54	76	8.59	107	12.09
1/4	28	56	6.33	87	9.83	123	13.90
5/16	18	101	11.41	157	17.74	221	24.97
5/16	24	112	12.65	173	19.55	245	27.69
3/8	16	180	20.33	278	31.41	392	44.30
3/8	24	204	23.04	315	35.60	445	50.29
7/16	14	288	32.53	445	50.29	628	70.96
7/16	20	321	36.26	496	56.05	700	79.10
1/2	13	439	49.59	678	76.61	958	108.25
1/2	20	495	55.92	764	86.33	1080	122.04

HOW TO USE TORQUE TABLES - Continued

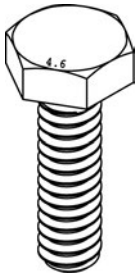
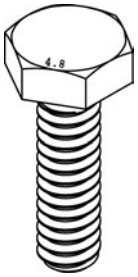
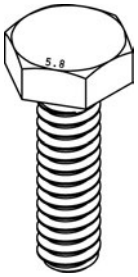
Table 4. Wet Torque Limits for SAE Standard Torque, 9/16" – 1" (SAE Grades 2, 5 and 8)

	Material Grade Markings		
	 Figure 10. SAE Grade 2.	 Figure 11. SAE Grade 5.	 Figure 12. SAE Grade 8.

Diameter	Threads Per Inch	Torque					
inch		ft-lbs	N·m	ft-lbs	N·m	ft-lbs	N·m
9/16	12	53	71.87	82	111.19	115	155.92
9/16	18	59	80.00	91	123.38	128	173.54
5/8	11	73	98.99	113	153.21	159	215.57
5/8	18	82	111.17	127	172.19	180	244.05
3/4	10	129	174.90	201	272.52	282	382.34
3/4	16	144	195.24	223	302.35	315	427.08
1	8	—	—	483	654.95	683	926.15
1	12	—	—	528	715.97	746	1011.58

HOW TO USE TORQUE TABLES - Continued

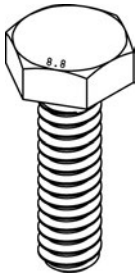
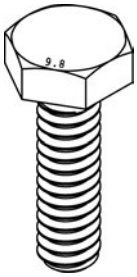
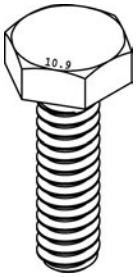
Table 5. Dry Torque Limits for Metric Standard Torque, 3mm – 14mm (Class 4.6, 4.8 and 5.8)

	Material Grade Markings		
	 Figure 13. Class 4.6	 Figure 14. Class 4.8	 Figure 15. Class 5.8

Diameter	Thread Pitch	Torque					
millimeter		in-lbs	N·m	in-lbs	N·m	in-lbs	N·m
3.0	0.5	4	0.45	6	0.68	–	–
3.5	0.6	7	0.79	10	1.13	–	–
4.0	0.7	11	1.24	14	1.58	–	–
5.0	0.8	21	2.37	29	3.28	35	3.96
6.0	1.0	35	3.96	50	5.65	61	6.89
8.0	1.25	88	9.94	120	13.56	148	16.72
10.	1.50	174	19.66	239	27.01	293	33.11
12.0	1.75	302	34.13	416	47.01	513	57.97
14.0	2.0	481	54.35	664	75.03	814	91.98

HOW TO USE TORQUE TABLES - Continued

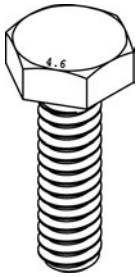
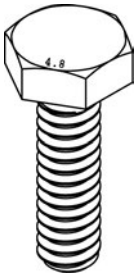
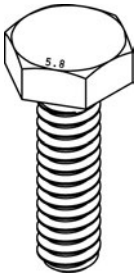
Table 6. Dry Torque Limits for Metric Standard Torque, 8mm – 36mm (Class 8.8, 9.8 and 10.9)

	Material Grade Markings		
	 Figure 16. Class 8.8	 Figure 17. Class 9.8	 Figure 18. Class 10.9

Diameter	Thread Pitch	Torque					
millimeter		ft-lbs	N·m	ft-lbs	N·m	ft-lbs	N·m
8.0	1.25	19	25.76	21	28.48	27	36.61
10.0	1.50	38	51.53	42	56.95	53	71.87
12.0	1.75	67	90.85	73	98.98	93	126.11
14.0	2.00	107	145.09	116	157.30	147	199.33
16.0	2.00	167	226.45	181	245.44	231	313.24
20.0	2.50	325	440.70	353	478.67	450	610.20
24.0	3.00	562	762.07	609	825.80	778	1054.97
30.0	3.50	1117	1514.65	1210	1640.76	1545	2095.02
36.0	4.00	1952	2646.91	2115	2867.94	2701	3662.56

HOW TO USE TORQUE TABLES - Continued

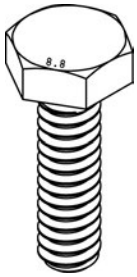
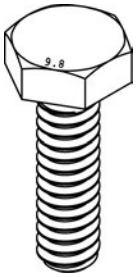
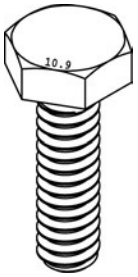
Table 7. Wet Torque Limits for Metric Standard Torque, 3mm – 14mm (Class 4.6, 4.8 and 5.8)

	Material Grade Markings		
	 Figure 19. Class 4.6	 Figure 20. Class 4.8	 Figure 21. Class 5.8

Diameter	Thread Pitch	Torque					
millimeter		in-lbs	N·m	in-lbs	N·m	in-lbs	N·m
3.0	0.5	4	0.45	4	0.45	–	–
3.5	0.6	5	0.57	7	0.79	–	–
4.0	0.7	8	0.90	11	1.24	–	–
5.0	0.8	16	1.81	22	2.49	27	3.05
6.0	1.0	27	3.05	37	4.18	46	5.20
8.0	1.25	66	7.46	90	10.17	111	12.54
10.	1.50	130	14.69	177	20.00	220	24.86
12.0	1.75	227	25.65	310	35.03	381	43.05
14.0	2.0	361	40.79	496	56.05	611	69.04

HOW TO USE TORQUE TABLES - Continued

Table 8. Wet Torque Limits for Metric Standard Torque, 8mm – 36mm (Class 8.8, 9.8 and 10.9)

	Material Grade Markings		
	 Figure 22. Class 8.8	 Figure 23. Class 9.8	 Figure 24. Class 10.9

Diameter	Thread Pitch	Torque					
millimeter		ft-lbs	N·m	ft-lbs	N·m	ft-lbs	N·m
8.0	1.25	15	20.34	16	21.70	20	27.12
10.0	1.50	29	39.32	31	42.04	40	54.24
12.0	1.75	50	67.80	55	74.58	69	93.56
14.0	2.00	80	108.48	87	117.97	111	150.52
16.0	2.00	125	169.5	136	184.42	173	234.59
20.0	2.50	244	330.86	264	357.98	338	458.33
24.0	3.00	422	572.23	457	619.69	583	790.55
30.0	3.50	838	1136.33	908	1231.25	1159	1571.60
36.0	4.00	1464	1985.18	1586	2150.62	2025	2745.90

END OF WORK PACKAGE

CHAPTER 4

REPAIR PARTS AND SPECIAL TOOLS LIST

MAINTAINER
REPAIR PARTS AND SPECIAL TOOL LIST (RPSTL) INTRODUCTION

INTRODUCTION

SCOPE

This RPSTL lists the authorized spares and repair parts; special tools; special test, measurement, and diagnostic equipment (TMDE); and other special support equipment required for performance of maintainer maintenance of the Modular Fuel System (MFS) Tank Rack Module (TRM). It authorizes the requisitioning, issue, and disposition of spares, repair parts, and special tools as indicated by the source, maintenance, and recoverability (SMR) codes.

GENERAL

In addition to the Introduction work package, this RPSTL is divided into the following work packages.

Repair Parts List Work Packages. Work packages containing lists of spare and repair parts authorized for use in the performance of maintenance at the levels determined by the MAC/SMR code. These work packages also include parts which must be removed for replacement of the authorized parts. Parts lists are composed of functional groups in ascending alphanumeric sequence, with the parts in each group listed in ascending Figure and item number sequence. Sending units, brackets, filters, and bolts are listed with the component they mount on. Bulk materials are listed by item name in the Bulk Items work package which follows the Kits work package. Repair parts kits are listed separately in their own functional group and work package.

Kits work package. This work package lists all repair kits and their component parts.

Bulk Items Work Package. This work package lists all items identified as ‘bulk’ in the parts lists. Due to the nature of bulk items, this work package does not include a Figure.

Cross-Reference Indexes Work Packages. There are two cross-reference indexes work packages in this RPSTL. The National Stock Number (NSN) Index work package refers you to the Figure and item number for each NSN listed in the RPSTL. The Part Number Index work package refers you to the figure and item number for each part number listed in the RPSTL.

EXPLANATION OF COLUMNS IN THE REPAIR PARTS LIST AND SPECIAL TOOLS LIST WORK PACKAGES

ITEM NO. (Column 1). Indicates the number used to identify items called out in the illustration.

SMR CODE (Column 2). The SMR code containing supply/requisitioning information, maintenance level authorization criteria, and disposition instruction, as shown in the following breakout. This entry may be subdivided into 4 subentries, one for each service.

Table 1. SMR Code Explanation.

Source Code		Maintenance Code	Recoverability Code
XX		XX	X
1st two positions: How to get an item.	3rd position: Who can install, replace, or use the item.	4th position: Who can do complete repair on the item	5th position: Who determines disposition action on unserviceable items.

NOTE

Complete Repair: Maintenance capacity, capability, and authority to perform all corrective maintenance tasks of the "Repair" function in a use/user environment in order to restore serviceability to a failed item.

Source Code. The source code tells you how you get an item needed for maintenance, repair, or overhaul of an end item/equipment. Explanations of source codes follow:

Table 2. Source Code Explanation.

Source Code	Application/Explanation
PA PB PC PD PE PF PG PH PR PZ	Stock items; use the applicable NSN to requisition/ request items with these source codes. They are authorized to the level indicated by the code entered in the third position of the SMR code. **NOTE** Items coded PC are subject to deterioration.
KD KF KB	Items with these codes are not to be requested/ requisitioned individually. They are part of a kit that is authorized to the maintenance level indicated in the third position of the SMR code. The complete kit must be requisitioned and applied.
MF-Made at maintainer class MH-Made at below depot sustainment class ML-Made at SRA MD-Made at depot MG-Navy only	Items with these codes are not to be requisitioned/ requested individually. They must be made from bulk material which is identified by the P/N in the DESCRIPTION AND USABLE ON CODE (UOC) entry and listed in the bulk material group work package of the RPSTL. If the item is authorized to you by the third position code of the SMR code, but the source code indicates it is made at higher level, order the item from the higher level of maintenance.
AF-Assembled by maintainer class AH-Assembled by below depot sustainment class AL-Assembled by SRA	Items with these codes are not to be requested/ requisitioned individually. The parts that make up the assembled item must be requisitioned or fabricated and assembled at the level of maintenance indicated by the source code. If the third position of the SMR

Table 2. Source Code Explanation - Continued.

Source Code	Application/Explanation
AD-Assembled by depot AG - Navy only	code authorizes you to replace the item, but the source code indicates the item is assembled at a higher level, order the item from the higher level of maintenance.
XA	Do not requisition an "XA" coded item. Order the next higher assembly. (Refer to NOTE below.)
XB	If an item is not available from salvage, order it using the CAGEC and P/N.
XC	Installation drawings, diagrams, instruction sheets, field service drawings; identified by manufacturer's P/N.
XD	Item is not stocked. Order an XD-coded item through local purchase or normal supply channels using the CAGEC and P/N given, if no NSN is available.

NOTE

Cannibalization or controlled exchange, when authorized, may be used as a source of supply for items with the above source codes except for those items source coded "XA" or those aircraft support items restricted by requirements of AR 750-1.

Maintenance Code. Maintenance codes tell you the level(s) of maintenance authorized to use and repair support items. The maintenance codes are entered in the third and fourth positions of the SMR code as follows:

Third Position. The maintenance code entered in the third position tells you the lowest maintenance class authorized to remove, replace, and use an item. The maintenance code entered in the third position will indicate authorization to the following classes of maintenance:

Maintenance Code	Application/Explanation
C -	Crew
F -	Maintainer maintenance can remove, replace, and use the item.
H -	Below Depot Sustainment maintenance can remove, replace, and use the item.
L -	Specialized repair activity can remove, replace, and use the item.
G -	Afloat and ashore intermediate maintenance can remove, replace, and use the item (Navy only)
K -	Contractor facility can remove, replace, and use the item
Z -	Item is not authorized to be removed, replace, or used at any maintenance level
D -	Depot can remove, replace, and use the item.

NOTE

Army will use C in the third position. However, for joint service publications, other services may use O.

Fourth Position. The maintenance code entered in the fourth position tells you whether or not the item is to be repaired and identifies the lowest maintenance class with the capability to do complete repair (perform all authorized repair functions).

Maintenance Code	Application/Explanation
C -	Crew (operator) is the lowest class that can do complete repair.
F -	Maintainer is the lowest class that can do complete repair of the item.
H -	Below Depot Sustainment is the lowest class that can do complete repair of the item.
L -	Specialized repair activity is the lowest class that can do complete repair of the item.
D -	Depot is the lowest class that can do complete repair of the item.
G -	Both afloat and ashore intermediate levels are capable of complete repair of item. (Navy only)
K -	Complete repair is done at contractor facility
Z -	Nonreparable. No repair is authorized.
B -	No repair is authorized. No parts or special tools are authorized for maintenance of "B" coded item. However, the item may be reconditioned by adjusting, lubricating, etc., at the user level.

Recoverability Code. Recoverability codes are assigned to items to indicate the disposition action on unserviceable items. The recoverability code is shown in the fifth position of the SMR code as follows:

Recoverability Code	Application/Explanation
Z -	Nonreparable item. When unserviceable, condemn and dispose of the item at the level of maintenance shown in the third position of the SMR code.
F -	Reparable item. When uneconomically reparable, condemn and dispose of the item at the field level.
H -	Reparable item. When uneconomically reparable, condemn and dispose of the item at the below depot sustainment.
D -	Reparable item. When beyond lower level repair capability, return to depot. Condemnation and disposal of item are not authorized below depot.
L -	Reparable item. Condemnation and disposal not authorized below Specialized Repair Activity (SRA).

Recoverability Code	Application/Explanation
A -	Item requires special handling or condemnation procedures because of specific reasons (such as precious metal content, high dollar value, critical material, or hazardous material). Refer to appropriate manuals/directives for specific instructions.
G -	Field level reparable item. Condemn and dispose at either afloat or ashore intermediate levels. (Navy only)
K -	Reparable item. Condemnation and disposal to be performed at contractor facility.

NSN (Column (3)). The NSN(s) for the item is listed in this column.

CAGEC (Column (4)). The Commercial and Government Entity Code (CAGEC) is a five-digit code which is used to identify the manufacturer, distributor, or Government agency/activity that supplies the item.

PART NUMBER (Column (5)). Indicates the primary number used by the manufacturer (individual, company, firm, corporation, or Government activity), which controls the design and characteristics of the item by means of its engineering drawings, specifications, standards, and inspection requirements to identify an item or range of items.

NOTE

When you use an NSN to requisition an item, the item you receive may have a different part number from the number listed.

DESCRIPTION AND USABLE ON CODE (UOC) (Column (6)). This column includes the following information:

1. The federal item name, and when required, a minimum description to identify the item.
2. Part numbers of any bulk materials required if the item is to be locally manufactured or fabricated.
3. Hardness Critical Item (HCI). Items that require special handling or procedures to ensure protection against electromagnetic pulse (EMP) damage are marked with the letters ‘HCI.’
4. The statement END OF FIGURE appears below the last item description in column (6) for each Figure in the repair parts list, special tools repair parts, kits, bulk items, and special tools list work packages.
5. Refer to Usable on Code details presented later in this work package under SPECIAL INFORMATION.

QTY (Column (7)). The QTY (quantity per Figure) column indicates the quantity of the item used in the breakout shown on the illustration/Figure. A "V" appearing in this column instead of a quantity indicates that the quantity is variable and quantity may change from application to application.

EXPLANATION OF CROSS-REFERENCE INDEXES WORK PACKAGES FORMAT AND COLUMNS

1. National Stock Number (NSN) Index Work Package. NSNs in this index are listed in National Item Identification Number (NIIN) sequence.

STOCK NUMBER Column. This column lists the NSN in NIIN sequence. The NIIN consists of the last nine digits of the NSN. When using this column to locate an item, ignore the first four digits of the NSN. However, the complete NSN should be used when ordering items by stock number.

For example, if the NSN is 5385-01-574-1476, the NIIN is 01-574-1476.

FIG. Column. This column lists the number of the Figure where the item is identified/located. The Figures are in numerical order in the repair parts list and special tools list work packages.

ITEM Column. This column identifies the item associated with the Figure listed in the adjacent FIG. column. This item is also identified by the NSN listed on the same line.

2. Part Number (P/N) Index Work Package. Part numbers in this index are listed in ascending alphanumeric sequence (vertical arrangement of letter and number combinations which places the first letter or digit of each group in order A through Z, followed by the numbers 0 through 9 and each following letter or digit in like order).

PART NUMBER Column. This column indicates the part number assigned to the item.

FIG. Column. This column lists the number of the Figure where the item is identified/located in the repair parts list and special tools list work packages.

ITEM Column. The item number is the number assigned to the item as it appears in the Figure referenced in the adjacent Figure number column.

SPECIAL INFORMATION

UOC. The UOC appears in the lower left corner of the Description Column heading. Usable on codes are shown as "UOC:" in the Description Column (justified left) on the first line under the applicable item/nomenclature. Uncoded items are applicable to all models. Examples of the UOCs used in the RPSTL are:

Code	Used On
N/A	N/A

Fabrication Instructions. Bulk materials required to manufacture items are listed in the bulk material work package of this RPSTL. Part numbers for bulk material are also referenced in the Description Column of the line item entry for the item to be manufactured/fabricated. Detailed fabrication instructions for items source coded to be manufactured or fabricated are found in (WP 0113) through (WP 0066) of this technical manual.

Index Numbers. Items which have the word BULK in the Figure column will have an index number shown in the item number column. This index number is a cross-reference between the NSN/Part Number (P/N) Index work packages and the bulk material list in the bulk items work package.

HOW TO LOCATE REPAIR PARTS

1. When NSNs or Part Numbers Are Not Known.

First. Using the table of contents, determine the assembly group to which the item belongs. This is necessary since Figures are prepared for assembly groups and subassembly groups, and lists are divided into the same groups.

Second. Find the Figure covering the functional group or the sub functional group to which the item belongs.

Third. Identify the item on the Figure and note the number(s).

Fourth. Look in the repair parts list work packages for the Figure and item numbers. The NSNs and part numbers are on the same line as the associated item numbers.

2. When NSN Is Known.

First. If you have the NSN, look in the STOCK NUMBER column of the NSN index work package. The NSN is arranged in NIIN sequence. Note the Figure and item number next to the NSN.

Second. Turn to the Figure and locate the item number. Verify that the item is the one for which you are looking.

3. When Part Number Is Known.

First. If you have the part number and not the NSN, look in the PART NUMBER column of the part number index work package. Identify the Figure and item number.

Second. Look up the item on the Figure in the applicable repair parts list work package.

ABBREVIATIONS

The following list includes uncommon abbreviations used in the RPSTL. For definitions/explanations of other abbreviations, refer to *ASME Y14.38*.

Abbreviation	Explanation
NIIN	National Item Identification Number (consists of the last 9 digits of the NSN)
NSN	National Stock Number
RPSTL	Repair Parts and Special Tools Lists
SMR	Source, Maintenance, and Recoverability Code
TMDE	Test, Measurement, and Diagnostic Equipment

END OF WORK PACKAGE

MAINTAINER
MFS TRM

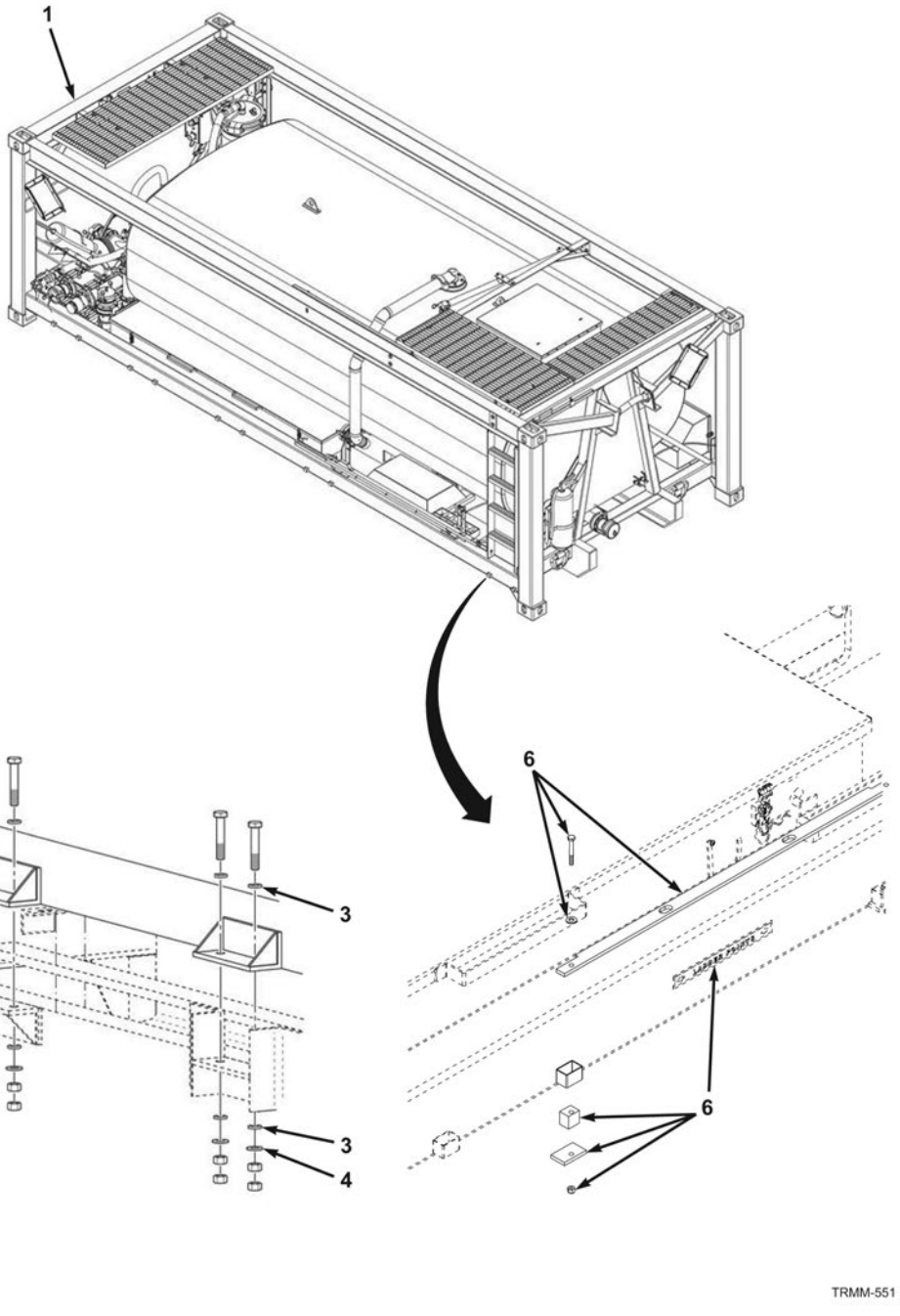


Figure 1. MFS TRM.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 0000 MFS TRM	
					FIG. 1. MFS TRM.	
* 1	PDFLL	4930-01-612-3541	55242	1051A	MODULAR FUEL SYSTEM TANK RACK MODULE (MFS TRM)	1
* 2	PAFZZ	5305-01-667-7347	05047	AEB02C625C50WA6 M31	. SCREW,CAP,HEXAGON H	20
* 3	PAFZZ	5310-01-666-3052	05047	AEW24X625000WJ1 M31	. WASHER, SPLIT	40
* 4	PAFZZ	5310-01-666-3053	05047	AEW07X612000SB8 A31	. WASHER, LOCK	20
* 5	PAFZZ	5310-01-666-0890	05047	AEN04C625000WB0 M31	. NUT, HEXHEAD	40
* 6	PAFZZ	2540-01-682-9585	55242	1051C-28	PARTS KIT,INSTALLATION AND EQUIPMENT KIT,VEHICLE (FOR SN 1 - 0949 ONLY)	1
					END OF FIGURE	

MAINTAINER
TANK ASSEMBLY

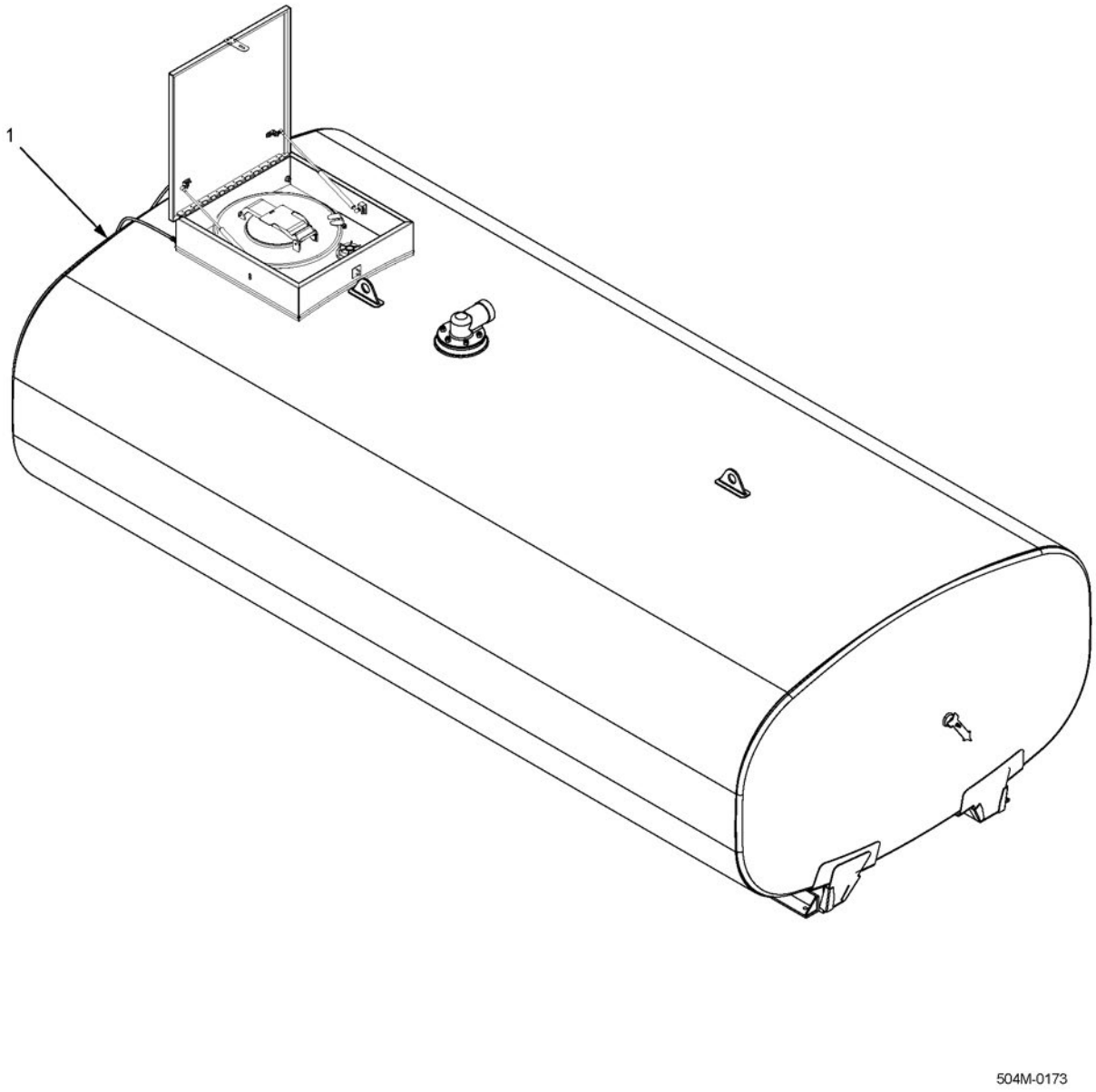


Figure 2. Tank Assembly.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 0100 TANK ASSEMBLY	
					FIG. 2. TANK ASSEMBLY.	
* 1	PDFLL	4930-01-669-3001	55242	1051B	TANK UNIT,FUEL DISPENSING,TRUCK MOUNTED.....	1
					END OF FIGURE	

MAINTAINER
BOTTOM LOADING VALVE (V1)

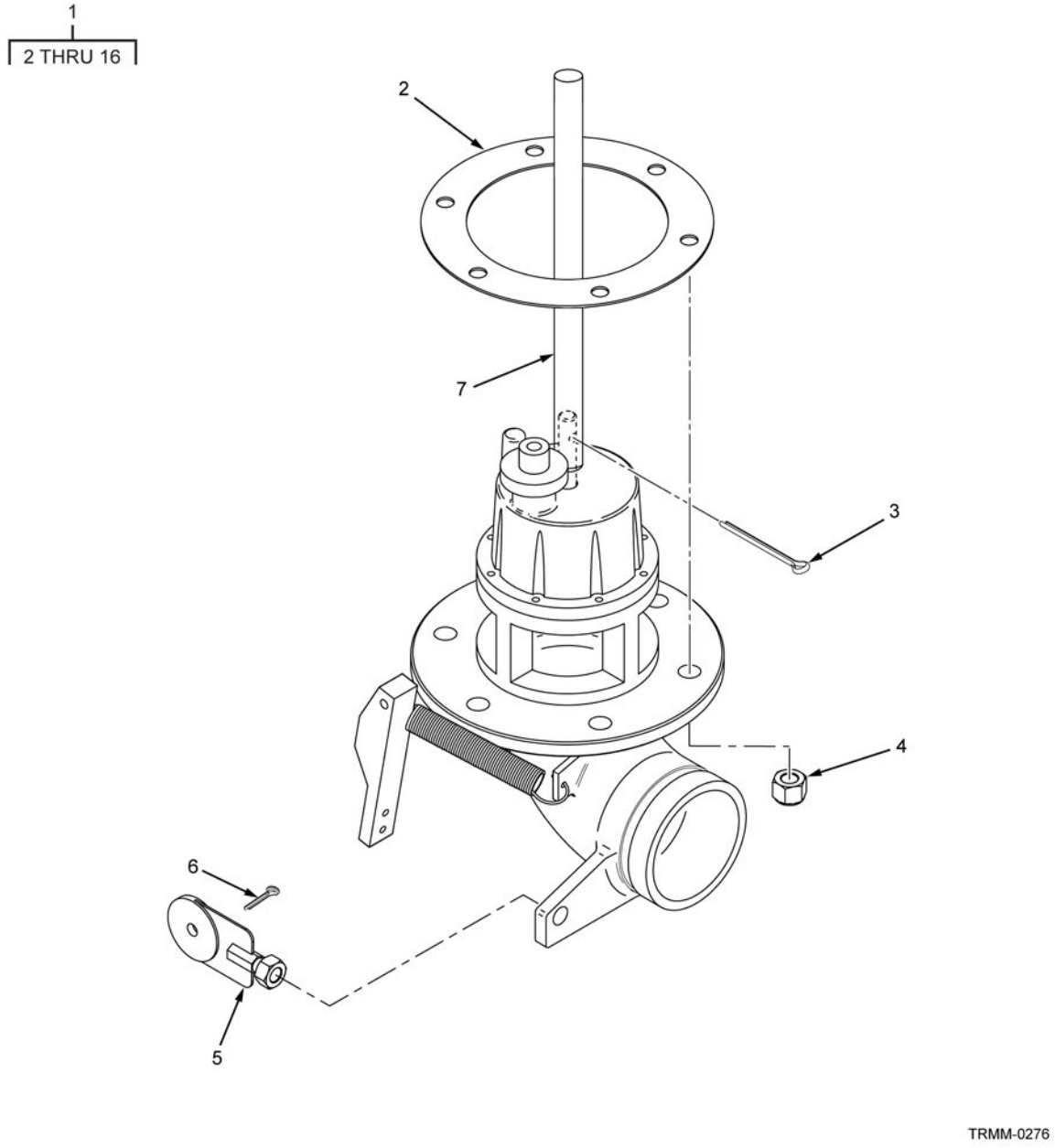


Figure 3. Bottom Loading Valve (V1) (Sheet 1 of 2).

8
9 THRU 17

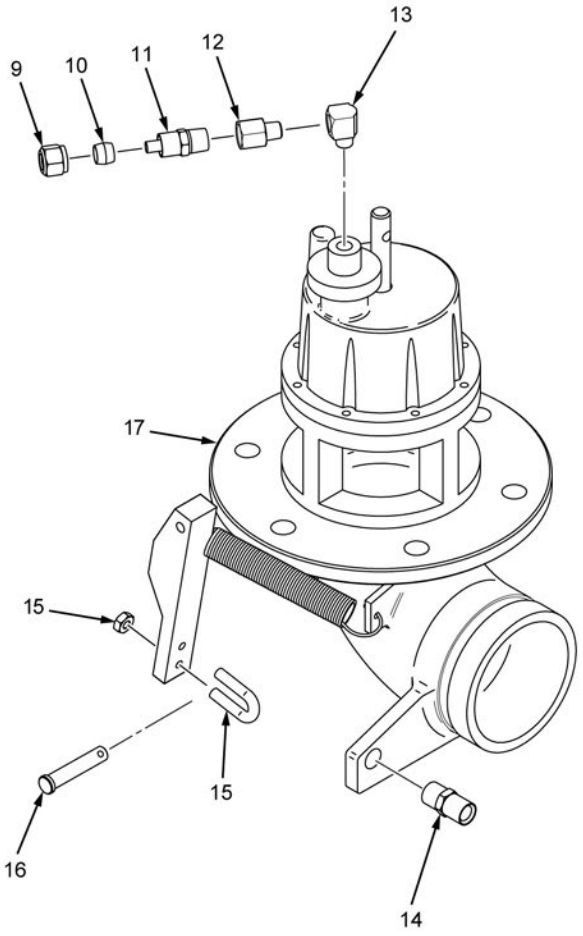


Figure 3. Bottom Loading Valve (V1) (Sheet 2 of 2).

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 0101 BOTTOM LOADING VALVE (V1)	
					FIG. 3. BOTTOM LOADING VALVE (V1).	
1	XCFZZ		55242	1051B-08	BOTTOM LOADING VALVE (V1) INSTALLATION	1
2	PCFZZ	5330-01-535-6104	13226	10232D	. GASKET	1
* 3	PAFZZ	5315-01-666-0937	05047	AEP02X187C00SB8 A31	. COTTER PIN	1
* 4	PAFZZ	5310-01-665-3139	05047	AEN04C500000SB8 A31	. NUT, PLAIN, HEXAGON	6
5	PAFZZ	5920-01-562-8032	13226	21050A	. FUSIBLE LINK	1
* 6	PAFZZ	5315-01-665-8790	05047	AEP02X125A00SB8 A31	. PIN, COTTER	1
* 7	PAFZZ	3040-01-665-6206	55242	1051B-01-14	. CONNECTING LINK,RIGID	1
* 8	PAFZZ	2910-01-665-4785	55242	1051B-22	. VALVE,FUEL SYSTEM	1
* 9	XDFZZ	4730-01-048-7874	0U583	J246 8 100110B	. . TUBE NUT	1
10	XDFZZ	4730-01-048-5260	81343	SAE J246 6 100115B	. . FERRULE	1
* 11	XDFZZ	4730-01-062-2570	81343	SAE J246 6-4 100102BA	. . ADAPTER,STRAIGHT,PIPE TO TUBE	1
12	XDFZZ	4730-00-652-6531	81343	SAE J514 2-4 140139B	. . ADAPTER, REDUCING	1
13	XDFZZ	4730-00-639-9730	81343	SAE J530 2-2 130239B	. . ELBOW, BRASS	1
14	XDFZZ	4730-00-069-1186	81343	SAE J246 6-4 120102BA	. . MALE CONNECTOR (BRASS FITTING)	1
* 15	XDFZZ	4030-01-665-8337	1CXX6	S0122-FS05	. . CLAMP,WIRE ROPE,SADDLED	1
16	XDFZZ		05047	AEP01X375A75SB8 A31	. . PIN,STRAIGHT HEADED	1
17	XDFZZ	2910-01-590-4511	0DT23	64129A	. . VALVE	1
					END OF FIGURE	

MAINTAINER
TANK DISCHARGE VALVE (V2)

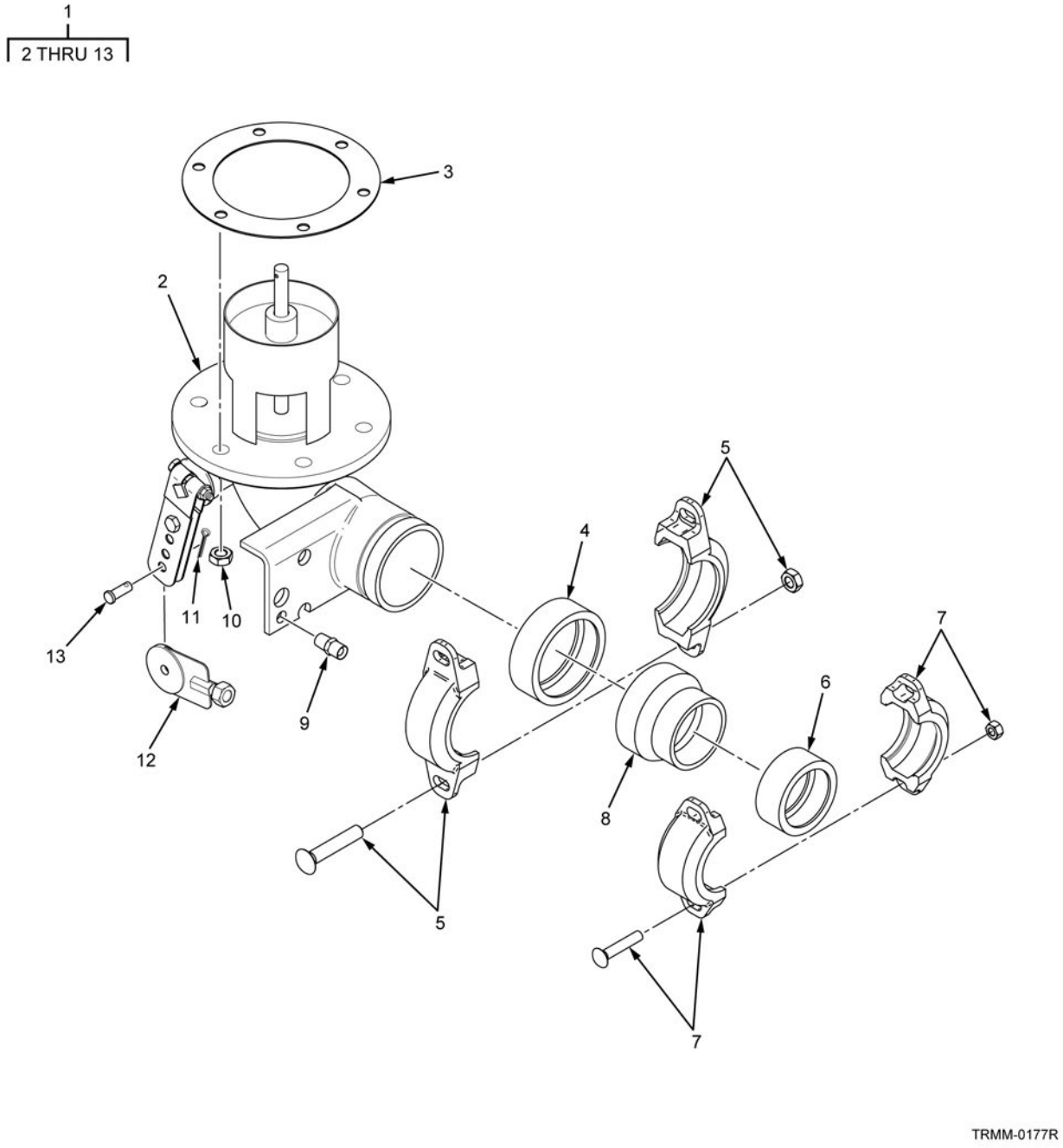


Figure 4. Tank Discharge Valve (V2).

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 0102 TANK DISCHARGE VALVE (V2)	
					FIG. 4. TANK DISCHARGE VALVE (V2).	
1	XCFZZ	4820-01-662-2151	55242	1051B-09	TANK DISCHARGE VALVE (V2) ASSEMBLY	1
* 2	PAFZZ	4820-01-665-4285	13226	EV46158ALTS	. VALVE,SAFETY RELIEF,REMOTE CONTROL	1
3	PCFZZ	5330-01-535-6104	3HMC9	10232D	. GASKET	1
4	PCFZZ	5330-00-391-8491	79154	G030077LT0	. GASKET	1
5	PAFZZ	4730-00-855-4919	79154	L030075PT0	. COUPLING, CLAMP, PIPE (INCLUDES TWO-PIECE COUPLING WITH HARDWARE)	1
6	PCFZZ	5330-01-398-5050	79154	G020077LT0	. GASKET	1
7	PAFZZ	4730-01-573-8259	79154	L020075PT0	. COUPLING, CLAMP, PIPE (INCLUDES TWO-PIECE COUPLING WITH HARDWARE)	1
* 8	PAFZZ	4730-01-662-2768	79154	50A-3-2	. REDUCER BODY,TUBE	1
9	PAFZZ	4730-00-069-1186	81343	SAE J246 6-4 120102BA	. MALE CONNECTOR	1
* 10	PAFZZ	5310-01-665-3139	05047	AEN04C500000SB8 A31	. NUT, PLAIN, HEXAGON	6
* 11	PAFZZ	5315-01-665-8790	05047	AEP02X125A00SB8 A31	. PIN, COTTER	1
12	PAFZZ	5920-01-562-8032	13226	21050A	. FUSIBLE LINK (INCLUDES CLAMPING NUT)	1
* 13	PAFZZ	5315-01-667-4317	05047	AEP01X312750SB8 A31	. PIN,STRAIGHT,HEADED	1
					END OF FIGURE	

MAINTAINER
JET LEVEL SENSOR

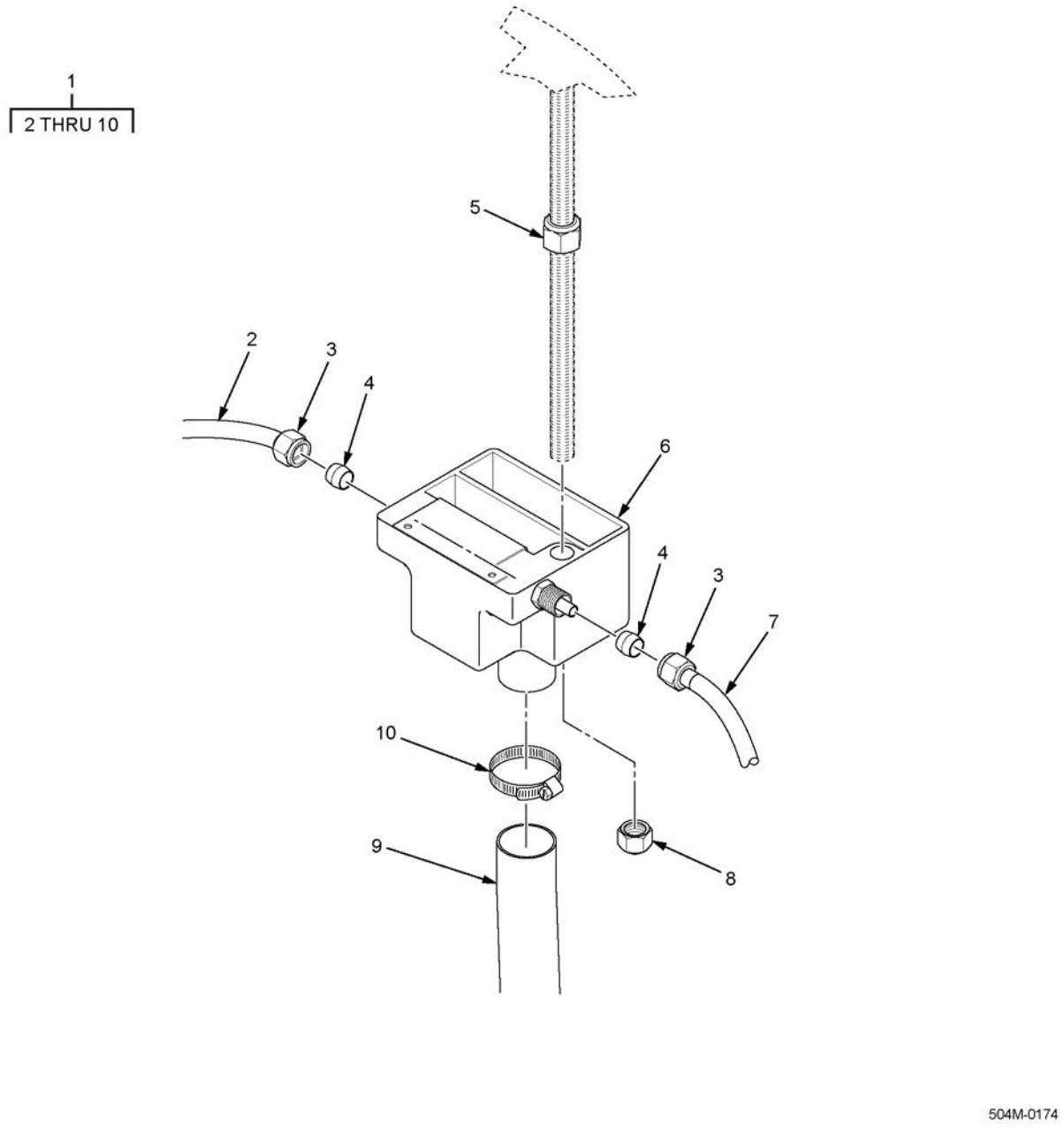


Figure 5. Jet Level Sensor.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 0104 JET LEVEL SENSOR	
					FIG. 5. JET LEVEL SENSOR.	
1	XCFZZ		55242	1051B-05	JET LEVEL SENSOR ASSEMBLY.....	1
2	PAFZZ	4710-01-661-9653	55242	1051B-05-03	. JET SENSOR OUTLET LINE.....	1
* 3	PAFZZ	4730-01-048-7873	0U583	SAE J246 6 100110B	. NUT,TUBE COUPLING.....	2
4	PAFZZ	4730-01-048-5260	81343	SAE J246 6 100115B	. FERRULE.....	2
* 5	PAFZZ	5310-01-665-3139	05047	AEN04C500000SB8 A31	. NUT, PLAIN, HEXAGON.....	1
6	PAFZZ	3950-01-663-4664	55242	1051B-05-05	. SENSOR, FUEL, JET.....	1
7	PAFZZ	4710-01-661-9650	55242	1051B-05-02	. JET SENSOR INLET LINE.....	1
* 8	PAFZZ	5310-01-475-9155	39428	91831A137	. NUT,SELF-LOCKING, HEXAGON.....	1
9	PAFZZ	4710-01-661-9772	55242	1051B-05-01	. JET SENSOR DRAIN LINE.....	1
* 10	PAFZZ	4730-01-662-1940	55242	ISO-1202	. CLAMP, HOSE.....	1
					END OF FIGURE	

MAINTAINER
MANHOLE COVER ASSEMBLY

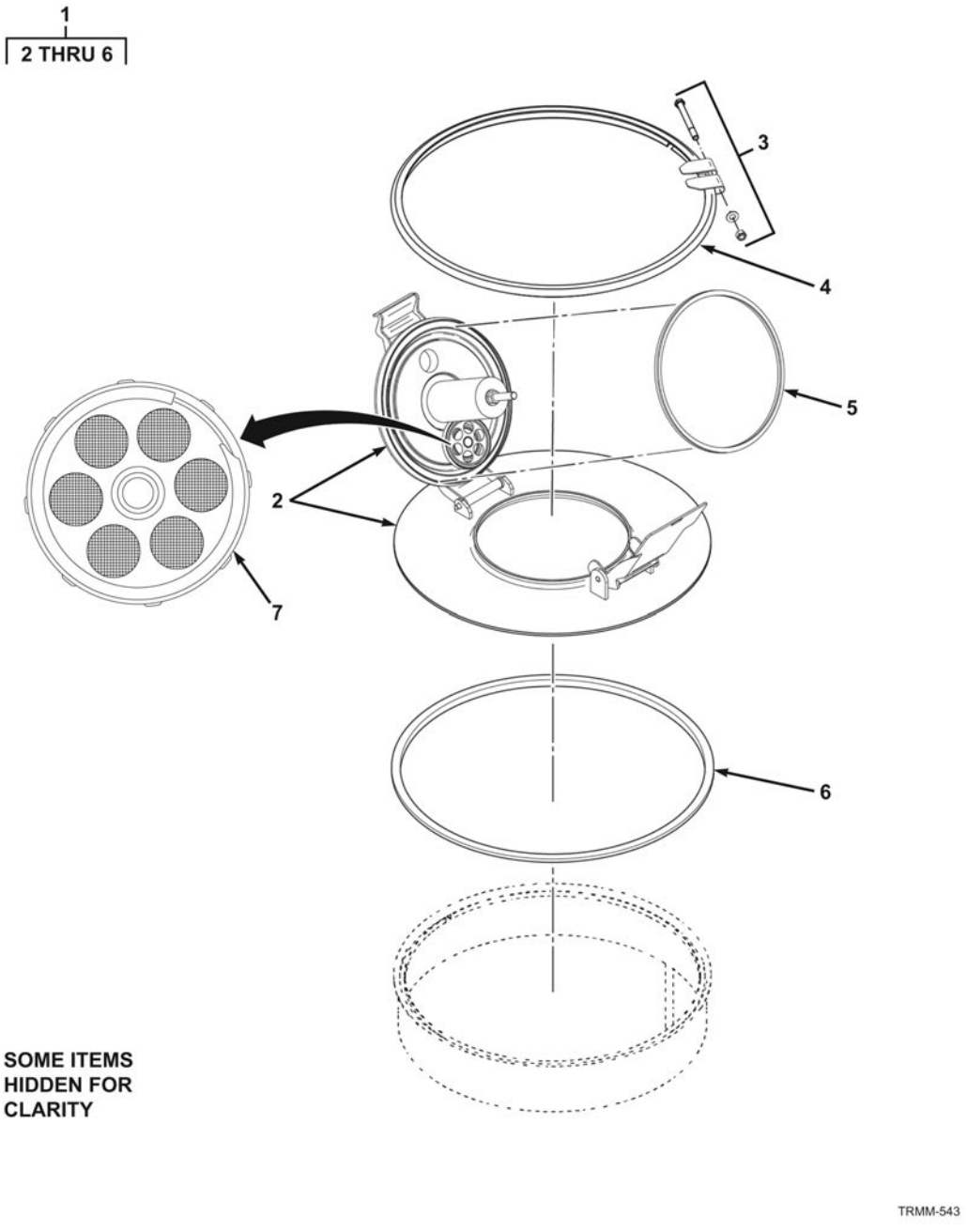


Figure 6. Manhole Cover Assembly.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 0105 MANHOLE COVER ASSEMBLY	
					FIG. 6. MANHOLE COVER ASSEMBLY.	
* 1	PAFZZ	2510-01-662-1260	13226	IVAL763CXB	COVER ASSEMBLY, MANHOLE	1
* 2	XAFZZ		13226	IVAL763CXB073	COVER, MANHOLE	1
3	PAFZZ	5306-01-077-5119	13226	4121SL001	. . CLAMP RING BOLT KIT (INCLUDES BOLT, WASHER, AND NUT)	1
4	PAFZZ	5365-00-138-2158	13226	3036SL	. . RING, CLAMPING	1
5	PCFZZ	5330-01-024-2311	13226	3119BN	. . O-RING (GASKET)	1
6	PCFZZ	5330-01-134-1986	13226	3560BN	. . GASKET	1
* 7	PAFZZ	2510-01-696-3836	13226	6234AL277	FLAME ARRESTER VENTILATION-EXHAUST (FIRE SCREEN, INCLUDES RETAINING CLIP AND O-RING)	1
					END OF FIGURE	

MAINTAINER
SPILLBOX LID ASSEMBLY

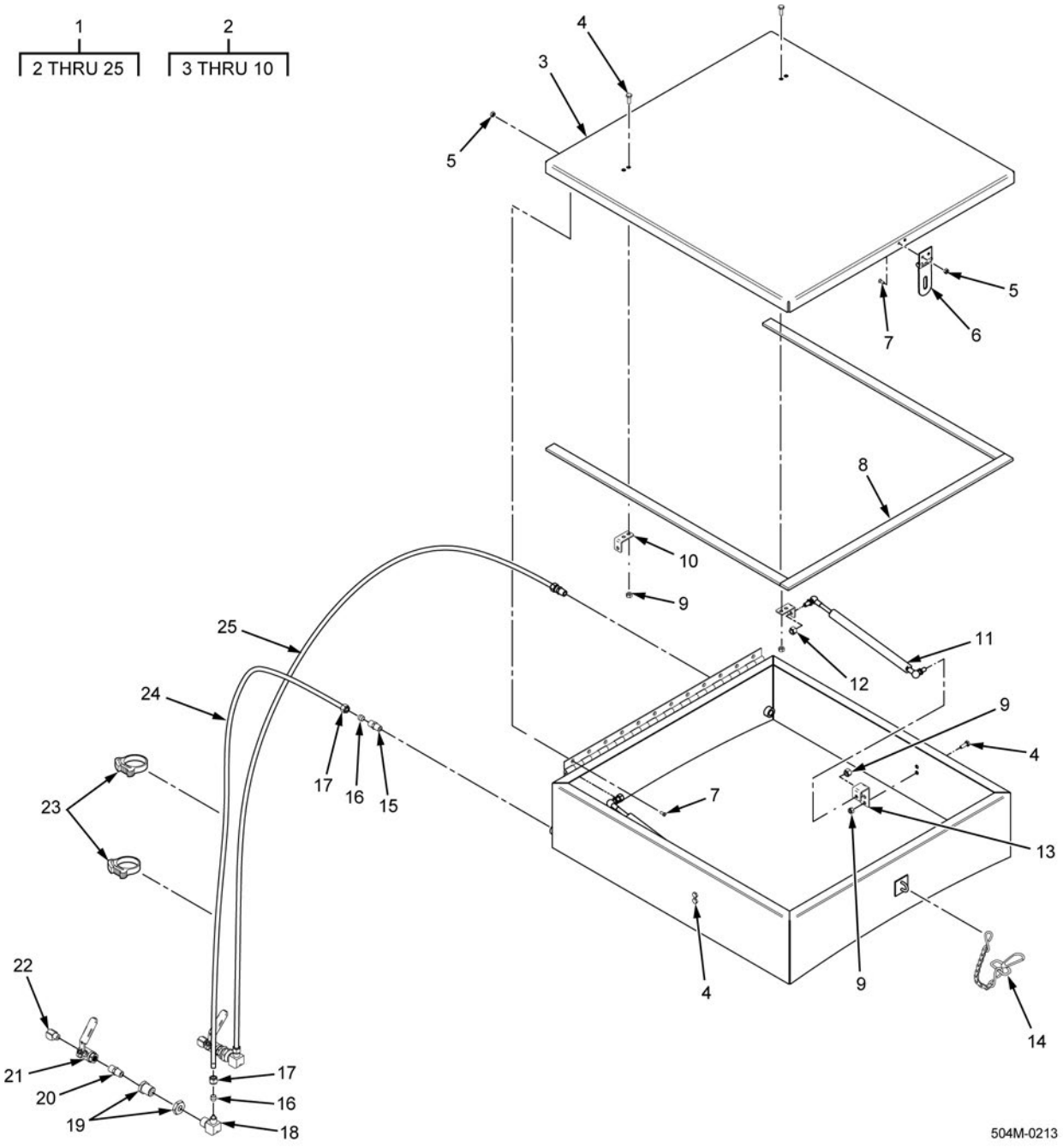


Figure 7. Spillbox Lid Assembly.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 0106 SPILLBOX LID ASSEMBLY	
					FIG. 7. SPILLBOX LID ASSEMBLY.	
1	XCFZZ		55242	1051B-02	SPILLBOX LID INSTALLATION	1
2	PAFZZ	5340-01-663-2563	55242	1051B-02-02	. SPILLBOX LID ASSEMBLY	1
* 3	XAFZZ		55242	1051B-02-04	. . SPILLBOX LID	1
* 4	PAFZZ	5305-01-665-1749	05047	AEB02C250750CH2 A31	. . SCREW,CAP, HEXAGON HEAD	8
* 5	PAFZZ	5310-01-463-4929	39428	91831A011	. . NUT,SELF-LOCKING, HEXAGON	8
* 6	PAFZZ	5340-01-662-7641	55242	ISO-1203	. . PADLOCK, HASP	1
* 7	PAFZZ	5305-01-665-7774	05047	AESF5C190500CH2 A31	. . SCREW, MACHINE	8
* 8	PAFZZ	5330-01-663-5104	55242	1051B-04	. . SPILL BOX LID GASKET	1
* 9	PAFZZ	5310-01-416-1851	39428	91831A029	. . NUT,SELF-LOCKING, HEXAGON	8
* 10	PAFZZ	5340-01-662-7659	55242	ISO-814	. . L BRACKET	2
* 11	PAFZZ	2540-20-010-5587	L00E3	465.407.200.511.180 .418	. CYLINDER ASSEMBLY,REACTION	2
* 12	PAFZZ	5310-01-592-2747	39428	94831A030	. NUT,PLAIN,EXTENDED WASHER,HEXAGON	4
13	PAFZZ	5340-01-662-6594	55242	ISO-815	. C BRACKET	2
14	PAFZZ	4010-01-663-6940	55242	1051B-15	. CHAIN, CLIP, S-HOOKS	1
* 15	PAFZZ	4730-01-062-2570	81343	SAE J246 6-4 100102BA	. ADAPTER,STRAIGHT,PIPE TO TUBE	3
16	PAFZZ	4730-01-048-5260	81343	SAE J246 6 100115B	. FERRULE	4
* 17	PAFZZ	4730-01-148-7873	0U583	SAE J246 6 100110B	. TUBE NUT	4
18	PAFZZ	4730-00-069-1187	81343	SAE J246 6-4 100202BA	. ELBOW, MALE, BRASS	2
19	PAFZZ	4730-01-164-3365	97403	13229E0849	. COUPLING, BULKHEAD, BRASS (INCLUDES NUT)	2
20	PAFZZ	4730-00-277-8289	93061	216P-4	. NIPPLE	2
* 21	PAFZZ	4820-01-665-4306	82666	T-255-FB-P 1/4	. VALVE, BALL, 1/4	2
* 22	PAFZZ	4730-00-278-4824	81343	4-4 140239B	. ELBOW, PIPE	2
23	PAFZZ	4730-99-371-9140	77ZT1	HC-G-PA66-BK	. SNAP GRIP CLIP	2
* 24	PAFZZ	4710-01-662-1868	55242	1051F-21-01	. TUBING,NONMETALLIC, 64 IN	1
* 25	PAFZZ	4710-01-662-1872	55242	1051F-21-02	. TUBING,NONMETALLIC, 60 IN	1
					END OF FIGURE	

MAINTAINER
VENT VALVE ASSEMBLY

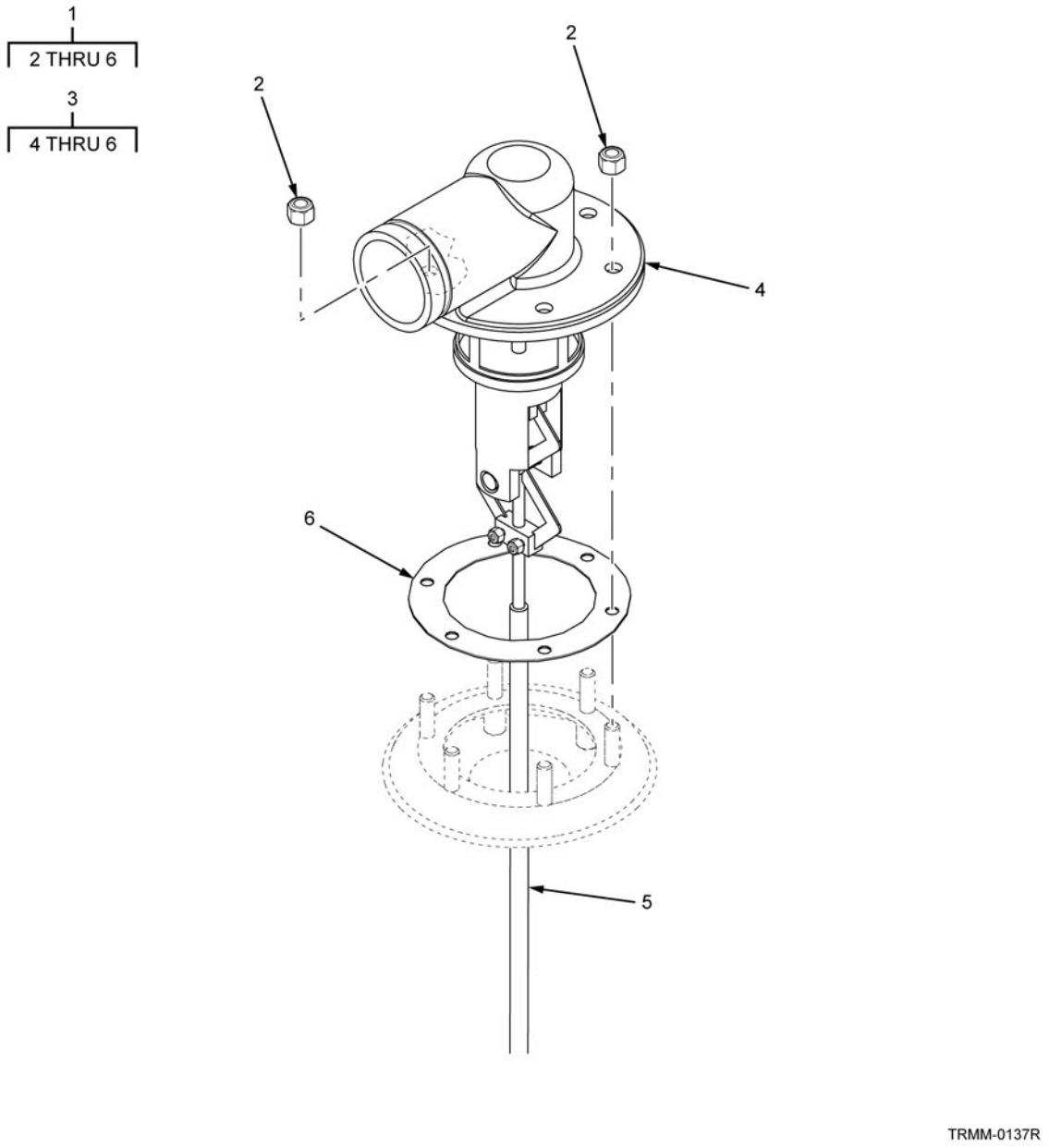


Figure 8. Vent Valve Assembly.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 0108 VENT VALVE ASSEMBLY	
					FIG. 8. VENT VALVE ASSEMBLY.	
1	XCFZZ	4820-01-661-9633	55242	1051B-11	VENT VALVE INSTALLATION	1
* 2	PAFZZ	5310-01-665-3139	05047	AEN04C500000SB8 A31	. NUT, PLAIN, HEXAGON	6
* 3	PAFZZ	4820-01-665-4310	55242	1051B-21	. VENT VALVE ASSEMBLY	1
* 4	XAFZZ		81118	64168	. . VENT VALVE	1
* 5	XAFZZ		55242	1051B-01-15	. . VENT VALVE GUIDE TUBE	1
6	PCFZZ	5330-01-535-6104	13226	10232D	. . GASKET	1
					END OF FIGURE	

MAINTAINER
(V17) DRY BREAK COUPLING (PORT F)

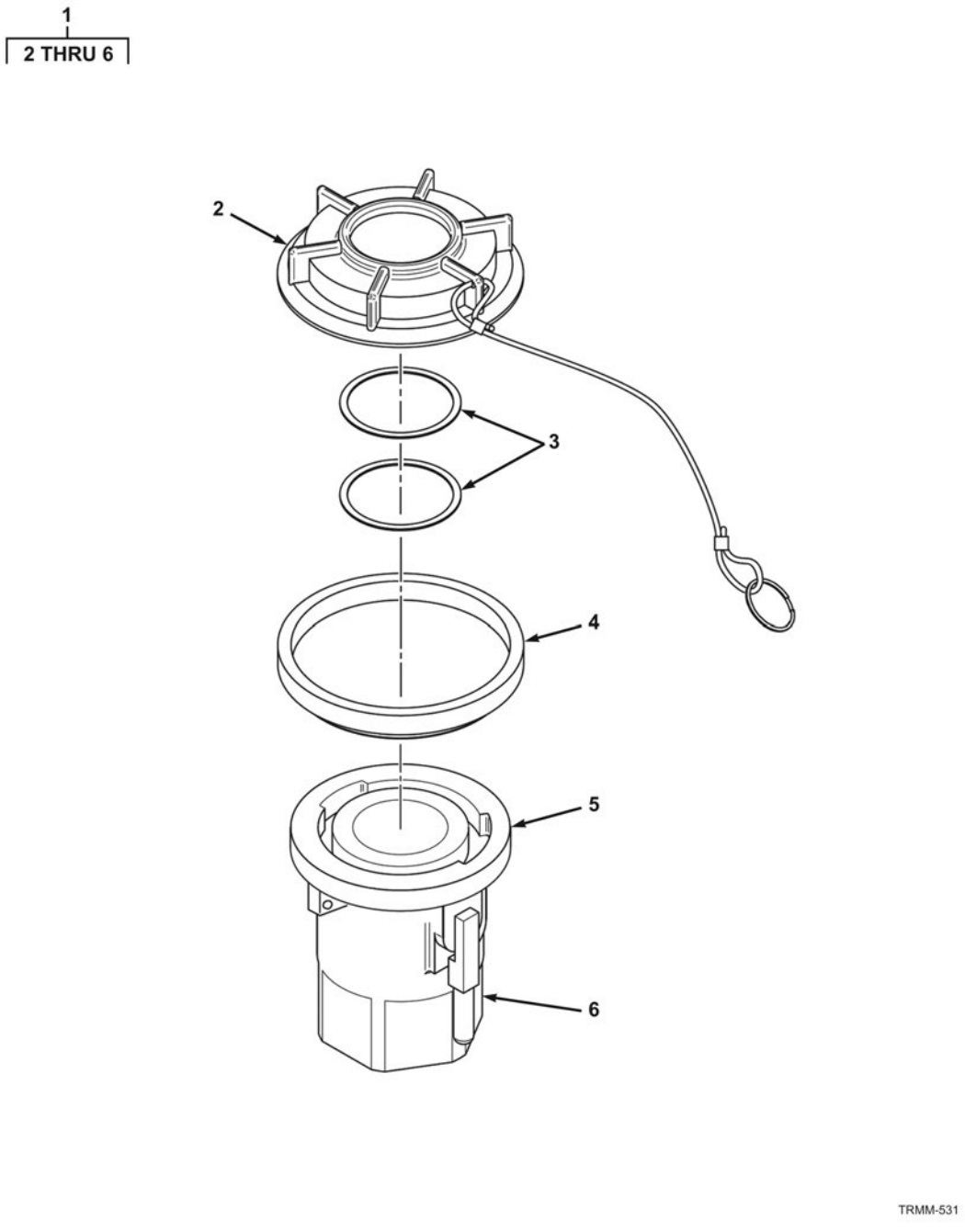


Figure 9. (V17) Dry Break Coupling (Port F).

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 0109 (V17) DRY BREAK COUPLING (PORT F)	
					FIG. 9. (V17) DRY BREAK COUPLING (PORT F).	
* 1	PAFFF	4820-01-662-2542	61125	USC10013	BODY,VALVE (V17 PORT F).....	1
* 2	PAFZZ	5340-01-645-2593	1WG21	RJA1002	. CAP,PROTECTIVE,DUST AND MOISTURE SEAL (INCLUDES LANYARD AND SPLIT RING).....	1
3	PCOZZ	5330-01-641-3634	1WG21	RJ0009	. SEAL, PLAIN.....	2
4	PCOZZ	2510-01-641-3811	1WG21	RJ0001	. CAP, BUMPER.....	1
* 5	XAFZZ		1WG21	RJ0002-1	. VALVE BODY.....	1
* 6	XAFZZ		1WG21	RJ0024-1	. ADAPTER,2 INCH FEMALE,NPT.....	1
					END OF FIGURE	

MAINTAINER
TANK GAUGE

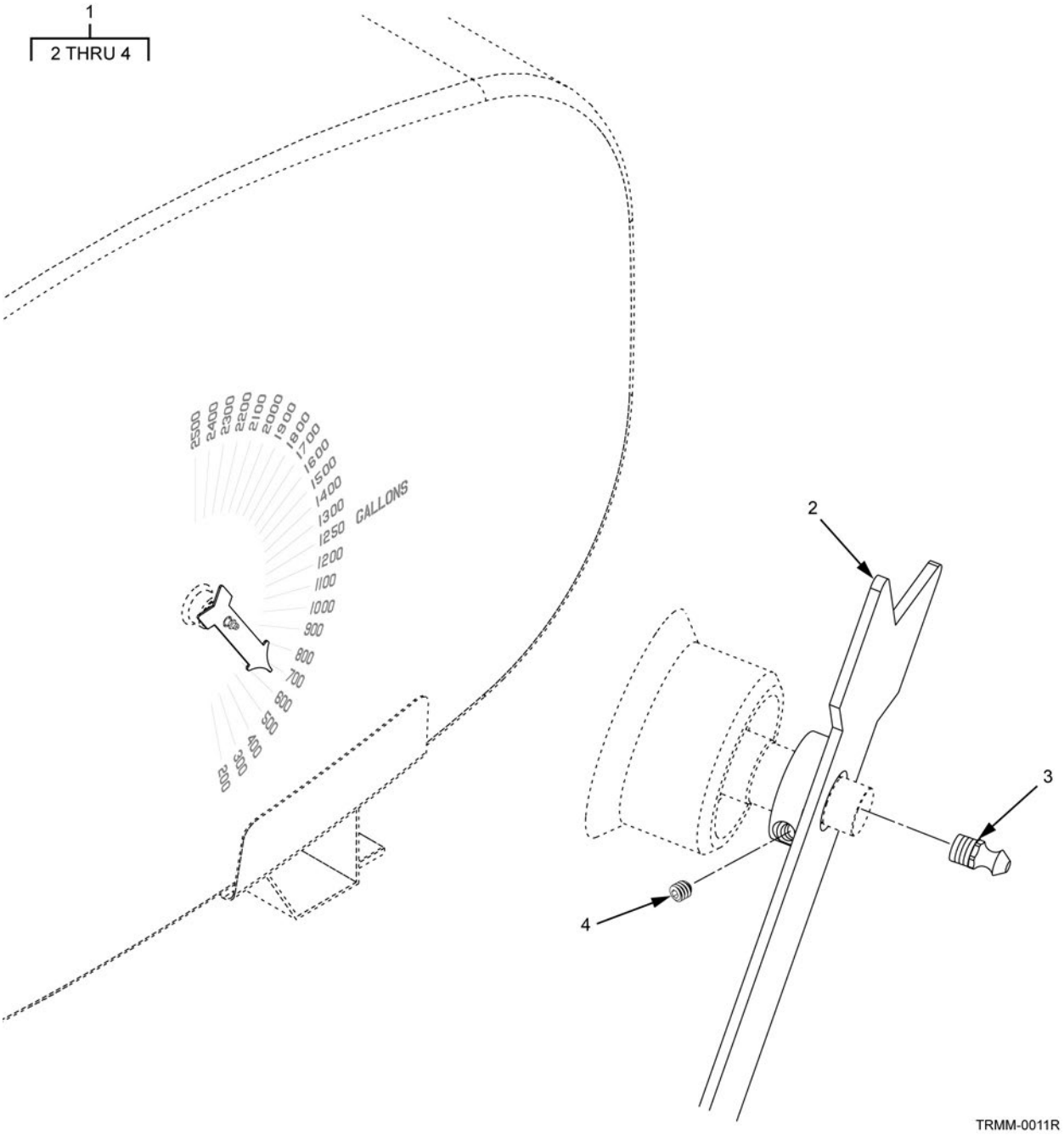


Figure 10. Tank Gauge.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 0110 TANK GAUGE	
					FIG. 10. TANK GAUGE.	
1	PAFZZ	6680-01-661-9473	55242	1051B-10	TANK GAUGE ASSEMBLY	1
2	XAFZZ		55242	ISO-797	. INDICATOR, LIQUID QUANTITY	1
3	XDFZZ		5CW36	400-020-319	. FITTING, LUBRICATION	1
4	XAFZZ		05047	AES14C164500DR2 A31	. SETSCREW	1
					END OF FIGURE	

MAINTAINER
GAUGE TUBE ASSEMBLY

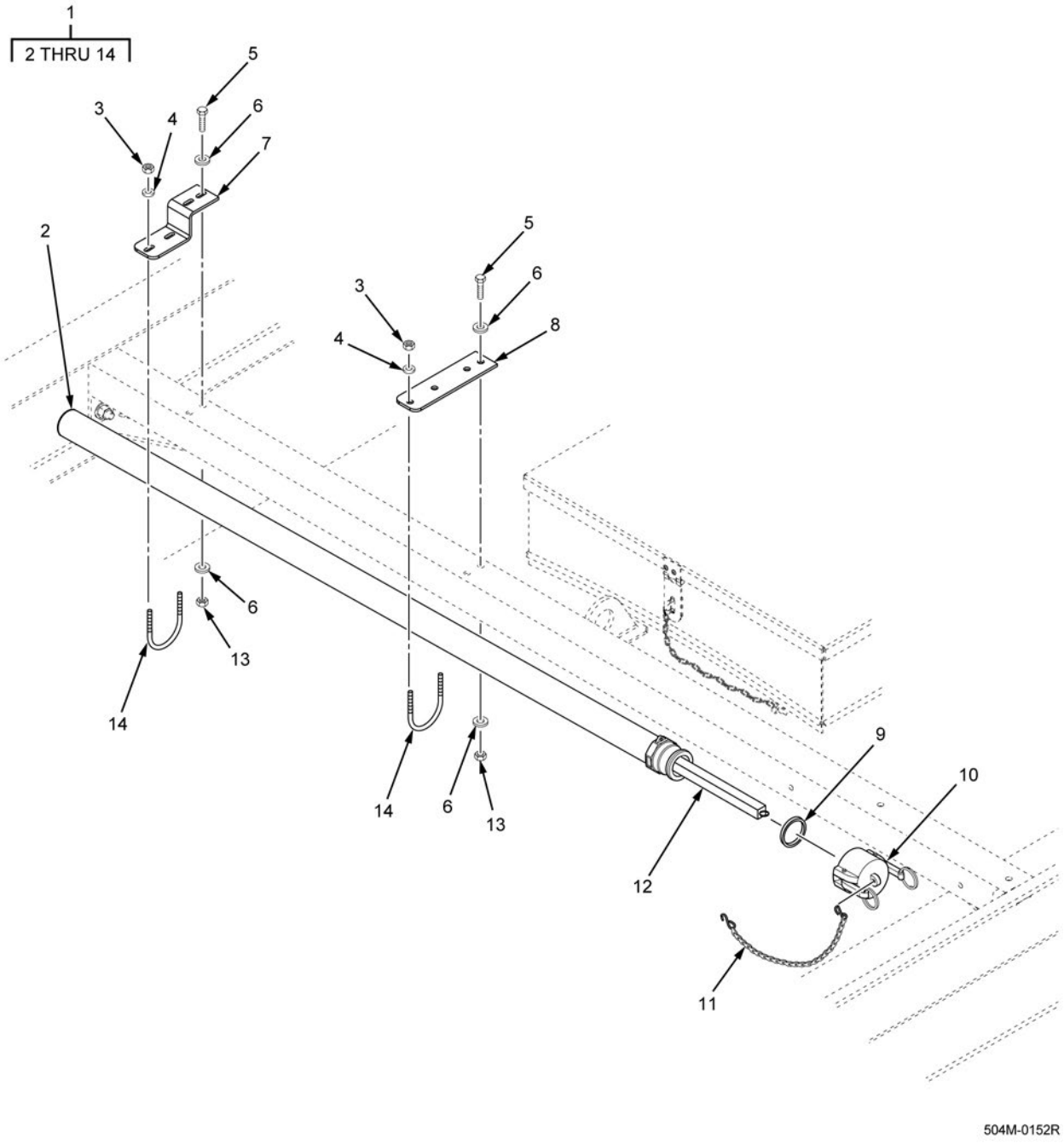


Figure 11. Gauge Tube Assembly.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 0111 GAUGE TUBE ASSEMBLY	
					FIG. 11. GAUGE TUBE ASSEMBLY.	
* 1	PAFZZ	4710-01-665-6539	55242	1051A-07	GAUGE TUBE ASSEMBLY	1
2	PAFZZ	5340-01-663-6649	55242	1051A-07-10	. GAUGE TUBE	1
* 3	PAFZZ	5310-01-499-3569	2V507	91831A030	. NUT,SELF-LOCKING, HEXAGON	4
* 4	PAFZZ	5310-01-665-0391	05047	AEW24X31N000SB8 A31	. WASHER, FLAT	4
* 5	PAFZZ	5306-01-665-3500	05047	AEB02C250A00CH2 A31	. BOLT,MACHINE	4
* 6	PAFZZ	5310-01-665-0396	05047	AEW24X25N000SB8 A31	. WASHER, FLAT	8
7	PAFZZ	5340-01-662-4916	55242	1051C-01-96	. OUTBOARD GAUGE TUBE BRACKET	1
8	PAFZZ	5340-01-662-5096	55242	1051C-01-98	. INBOARD GAUGE TUBE BRACKET	1
9	PCFZZ	5330-01-606-7073	58536	AA59326-G5	. GASKET	1
10	PAFZZ	5340-01-663-7875	72661	G150-DC-AL	. CAP, QUICK DISCONNECT	1
11	PAFZZ	4010-01-663-6041	55242	1051F-18-01	. SASH CHAIN W/ S-HOOKS	1
12	PAFZZ	5210-01-659-1891	55242	1051A-07-01	. GAUGE STICK, PETROLEUM	1
* 13	PAFZZ	5310-01-416-1851	39428	91831A029	. NUT,SELF-LOCKING, HEXAGON	4
* 14	PAFZZ	5306-01-674-8876	71747	50459 1	. UBOLT	2
					END OF FIGURE	

MAINTAINER
FRONT CATWALK ASSEMBLY

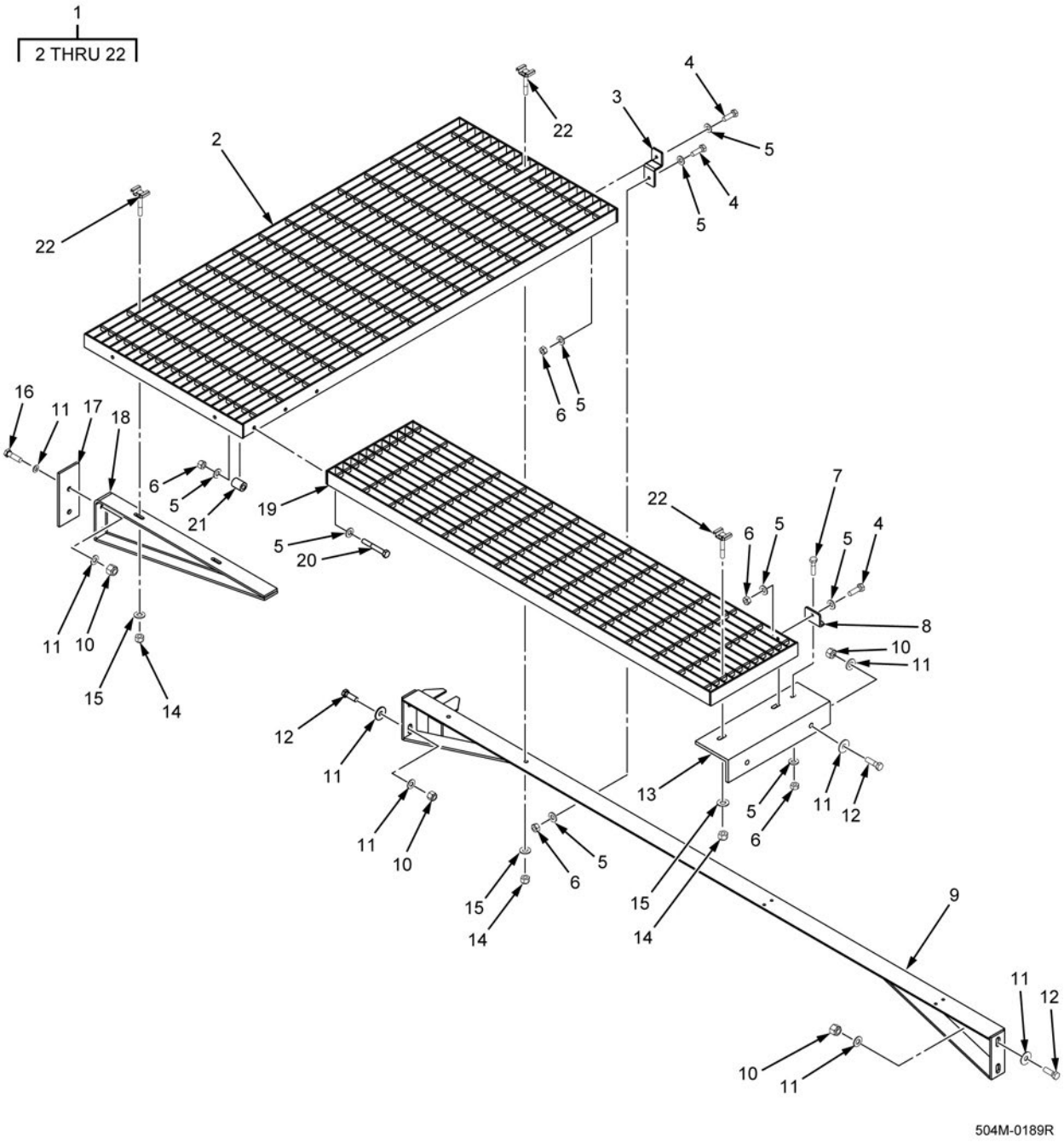


Figure 12. Front Catwalk Assembly.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 0201 CATWALK ASSEMBLY	
					FIG. 12. FRONT CATWALK ASSEMBLY.	
1	XCFZZ		55242	1051C-06	FRONT CATWALK ASSEMBLY	1
* 2	PAFZZ	2590-01-662-1702	55242	1051C-06-10	. .SERVICE KIT,PLATFORM,STANDING	1
3	PAFZZ	5340-01-663-2568	55242	1051C-16	. BRACKET, Z-SHAPED (CATWALK Z BRACKET)	2
* 4	PAFZZ	5306-01-665-3440	05047	AEB02C312A00CH2 A31	. BOLT,MACHINE	5
* 5	PAFZZ	5310-01-665-0391	05047	AEW24X31N000SB8 A31	. WASHER, FLAT	17
* 6	PAFZZ	5310-01-499-3569	2V507	91831A030	. NUT,SELF-LOCKING, HEXAGON	9
* 7	PAFZZ	5306-01-665-0900	05047	AEB02C312A25CH2 A31	. BOLT,MACHINE	1
8	PAFZZ	5340-01-663-0541	55242	1051C-18	. STOP PLATE (CATWALK LAP BRACKET STOP)	1
* 9	PAFZZ	2510-01-662-1255	55242	1051C-08	. BRACKET, MOUNTING (FRONT CATWALK SPAN BRACKET)	1
* 10	PAFZZ	5310-01-475-9155	39428	91831A137	. NUT,SELF-LOCKING, HEXAGON	8
* 11	PAFZZ	5310-01-665-0387	05047	AEW24X50N000SB8 A31	. WASHER, FLAT	16
* 12	PAFZZ	5306-01-664-9310	05047	AEB02C500A50CH2 A31	. BOLT,MACHINE HEXAGON HEAD	6
13	PAFZZ	5340-01-663-0535	55242	1051C-10-01	. BRACKET, ANGLE (FRONT CATWALK LAP BRACKET)	1
* 14	PAFZZ	5310-01-475-9244	39428	91831A127	. NUT,SELF-LOCKING, HEXAGON	6
* 15	PAFZZ	5310-01-665-0457	05047	AEW24X37N000SB8 A31	. WASHER, FLAT	6
* 16	PAFZZ	5305-01-665-1750	05047	AEB02C500A75CH2 A31	. SCREW,CAP,HEXAGON HEAD (BOLT)	2
17	PAFZZ	5340-01-663-2668	55242	1051C-04-04	. PLATE, MENDING (FRONT CATWALK DOUBLER MOUNT)	1
18	PAFZZ	5340-01-663-6071	55242	1051C-06-12	. BRACKET, ANGLE (FRONT RIGHT SIDE CATWALK BRACKET)	1
19	PAFZZ	5340-01-663-3992	55242	1051C-06-11	. GRATING, METAL (FRONT CATWALK FORWARD GRATE)	1
* 20	PAFZZ	5306-01-665-0683	05047	AEB02C312B25CH2 A31	. BOLT,MACHINE	3
21	PAFZZ	5365-01-663-8354	55242	1051C-06-06	. SPACER	3
22	PAFZZ	5340-01-662-7389	55242	ISO-809	. CLAMP, BLOCK (SADDLE CLIP)	6
					END OF FIGURE	

MAINTAINER
REAR CATWALK ASSEMBLY

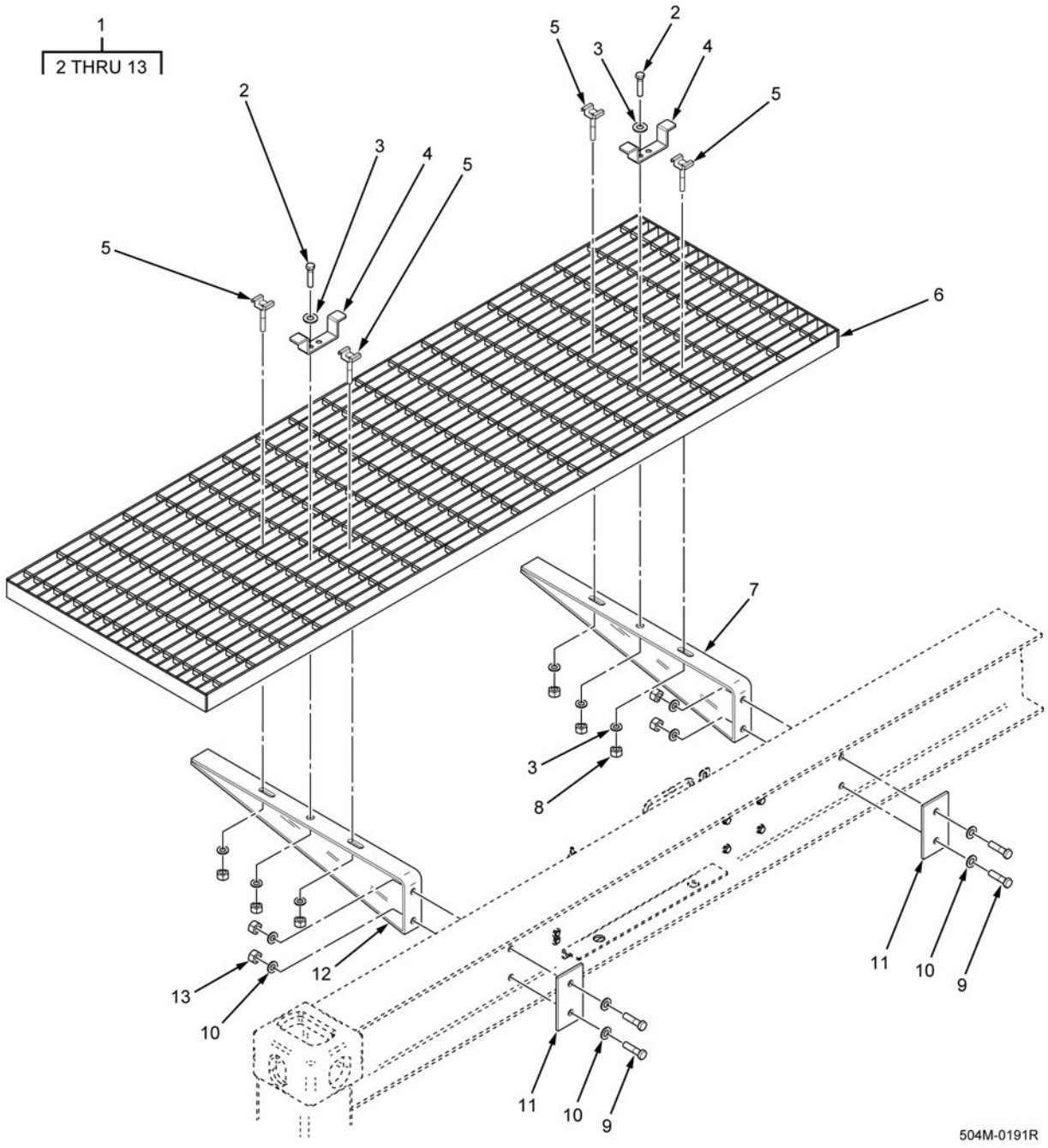


Figure 13. Rear Catwalk Assembly.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 0202 REAR CATWALK ASSEMBLY	
					FIG. 13. REAR CATWALK ASSEMBLY.	
1	XCFZZ		55242	1051C-04	REAR CATWALK ASSEMBLY	1
* 2	PAFZZ	5306-01-665-1752	05047	AEB02C375A50CH2A31	. SCREW,CAP, HEXAGON HEAD	2
* 3	PAFZZ	5310-01-665-0457	05047	AEW24X37N000SB8A31	. WASHER, FLAT	8
4	PAFZZ	5340-01-663-0537	55242	1051C-17	. STRAP, RETAINING (CATWALK, HAT BRACKET)	2
5	PAFZZ	5340-01-662-7389	55242	ISO-809	. CLAMP, BLOCK (SADDLE CLIP)	4
* 6	PAFZZ	2510-01-665-6625	55242	1051C-04-01	. GRATING, METAL	1
7	PAFZZ	5340-01-663-2570	55242	1051C-04-06	. BRACKET, ANGLE (BRACKET, CATWALK RIGHT)	1
* 8	PAFZZ	5310-01-475-9244	39428	91831A127	. NUT,SELF-LOCKING, HEXAGON	6
* 9	PAFZZ	5305-01-665-1750	05047	AEB02C500A75CH2A31	. SCREW,CAP,HEXAGON HEAD (BOLT)	4
* 10	PAFZZ	5310-01-665-0387	05047	AEW24X50N000SB8A31	. WASHER, FLAT	8
11	PAFZZ	5340-01-663-2668	55242	1051C-04-04	. PLATE, MENDING (CATWALK DOUBLER MOUNT)	2
12	PAFZZ	5340-01-663-0540	55242	1051C-04-02	. BRACKET, ANGLE (BRACKET, CATWALK LEFT)	1
* 13	PAFZZ	5310-01-475-9155	39428	91831A137	. NUT,SELF-LOCKING, HEXAGON	4
					END OF FIGURE	

MAINTAINER
FRONT HANDHOLD ASSEMBLY

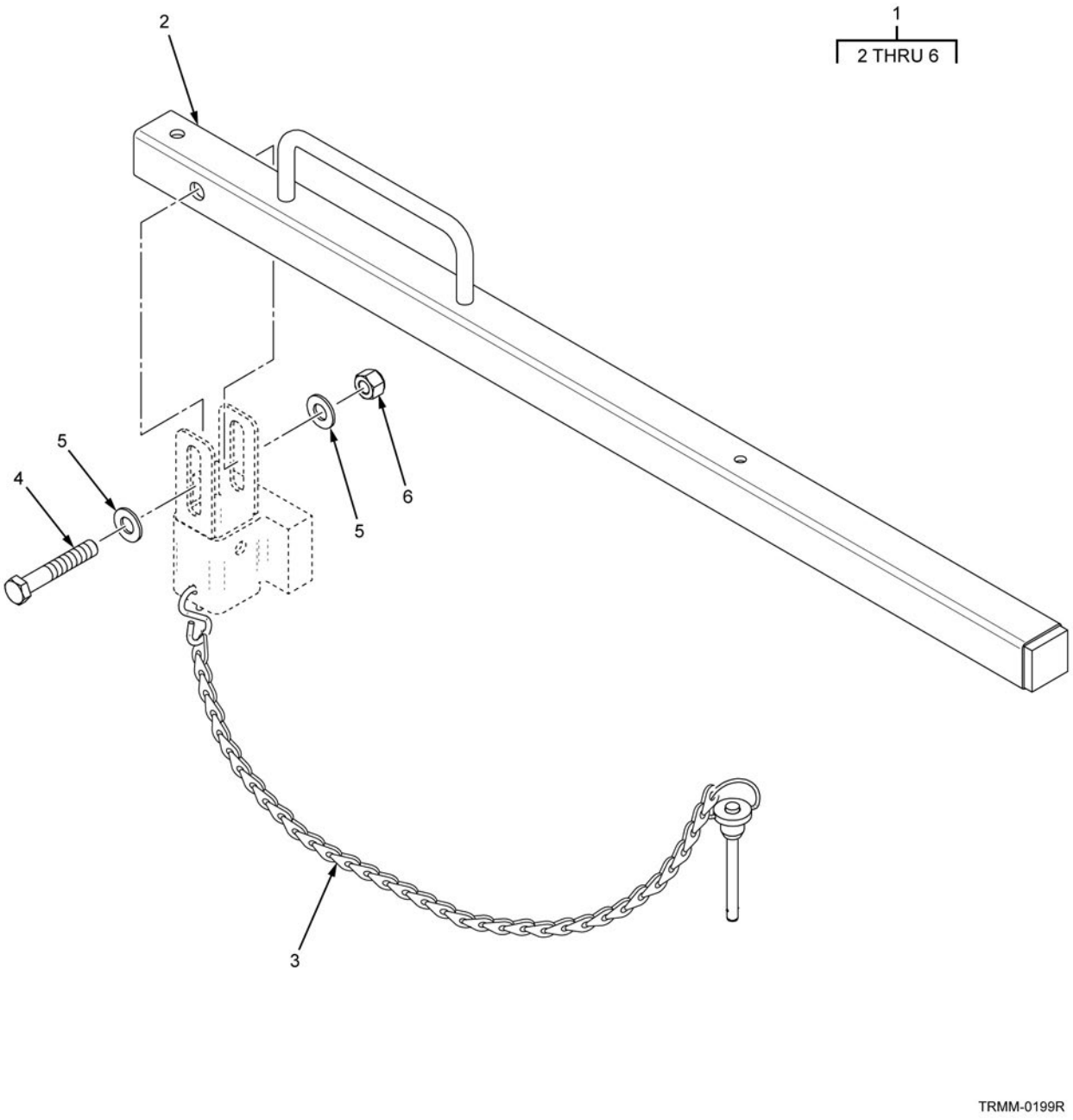


Figure 14. Front Handhold Assembly.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 0203 FRONT HANDHOLD ASSEMBLY	
					FIG. 14. FRONT HANDHOLD ASSEMBLY.	
1	XCFZZ	5340-01-663-4277	55242	1051C-12	FRONT HANDHOLD ASSEMBLY.....	1
2	PAFZZ	5340-01-663-4278	55242	1051C-12-02	. GRIP, HANDLE (HAND HOLD HANDLE).....	1
* 3	PAFZZ	4030-01-665-6614	55242	1051C-12-03	. COUPLING,BEAD CHAIN.....	1
* 4	PAFZZ	5306-01-665-0894	05047	AEB02C375B25CH2A31	. BOLT,MACHINE.....	1
* 5	PAFZZ	5310-01-665-0457	05047	AEW24X37N000SB8A31	. WASHER, FLAT.....	2
* 6	PAFZZ	5310-01-475-9244	39428	91831A127	. NUT,SELF-LOCKING, HEXAGON.....	1
					END OF FIGURE	

MAINTAINER
REAR HANDHOLD ASSEMBLY

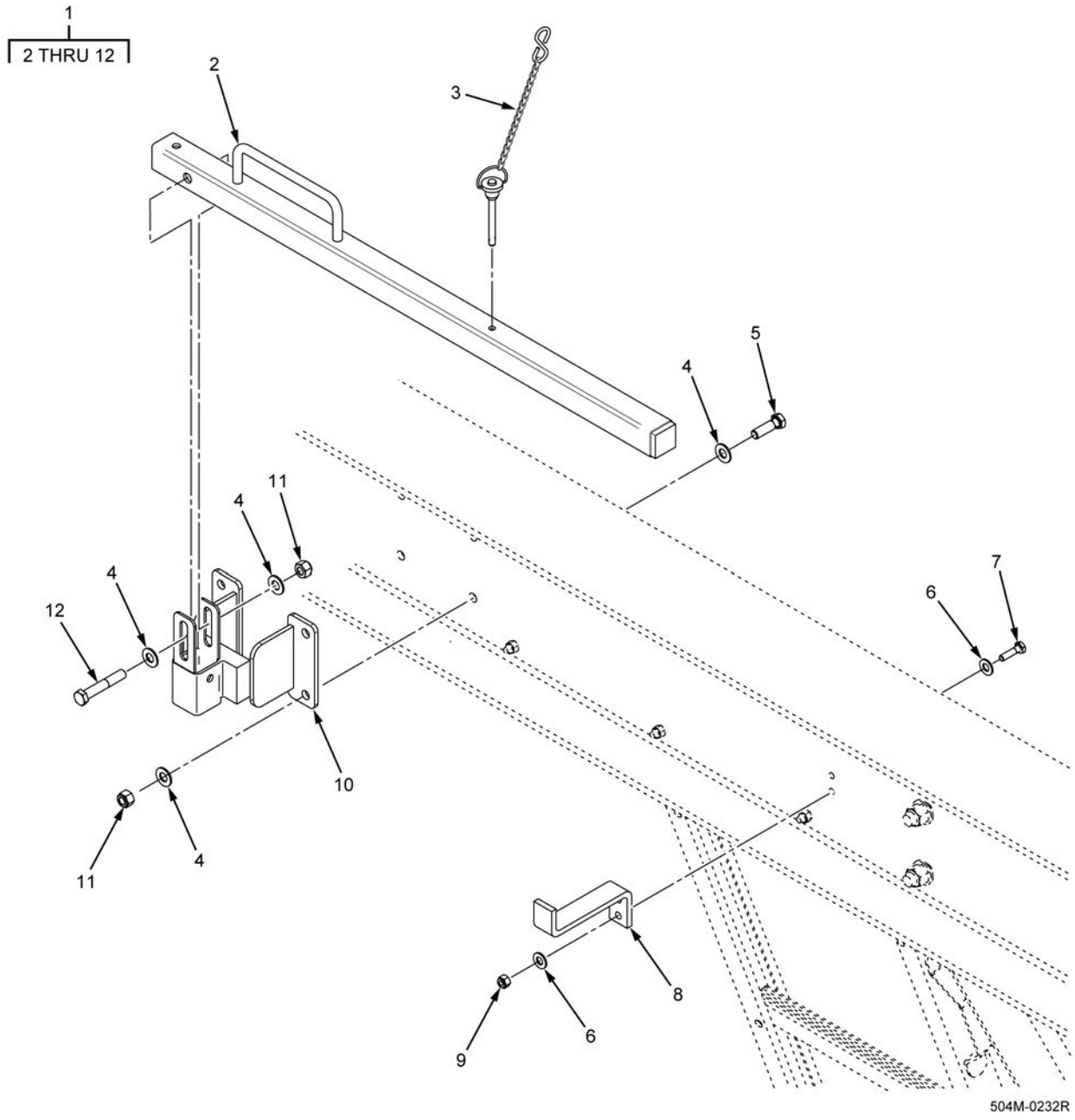


Figure 15. Rear Handhold Assembly.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 0204 REAR HANDHOLD ASSEMBLY	
					FIG. 15. REAR HANDHOLD ASSEMBLY.	
1	XCFZZ		55242	1051C-25	REAR HANDHOLD ASSEMBLY	1
2	PAFZZ	5340-01-663-4291	55242	1051C-25-01	. GRIP, HANDLE (HAND HOLD HANDLE)	1
* 3	PAFZZ	4010-01-663-4753	55242	1051C-25-03	. CHAIN PIN	1
* 4	PAFZZ	5310-01-665-0457	05047	AEW24X37N000SB8 A31	. WASHER, FLAT	10
* 5	PAFZZ	5305-01-665-1734	05047	AEB02C375A25CH2 A31	. SCREW,CAP, HEXAGON HEAD	4
* 6	PAFZZ	5310-01-665-0396	05047	AEW24X25N000SB8 A31	. WASHER, FLAT	4
* 7	PAFZZ	5306-01-665-3500	05047	AEB02C250A00CH2 A31	. BOLT,MACHINE	2
* 8	PAFZZ	5340-01-667-6663	55242	1051C-01-114	. BRACKET, DOUBLE ANGLE (HANDRAIL STOW REST BRACKET)	1
* 9	PAFZZ	5310-01-416-1851	39428	91831A029	. NUT,SELF-LOCKING, HEXAGON	2
* 10	PAFZZ	2510-01-662-1263	55242	1051C-01-91	. BRACKET,VEHICULAR COMPONENTS	1
* 11	PAFZZ	5310-01-475-9244	39428	91831A127	. NUT,SELF-LOCKING, HEXAGON	5
* 12	PAFZZ	5306-01-665-0894	05047	AEB02C375B25CH2 A31	. BOLT,MACHINE	1
					END OF FIGURE	

MAINTAINER
HANDRAIL ASSEMBLY

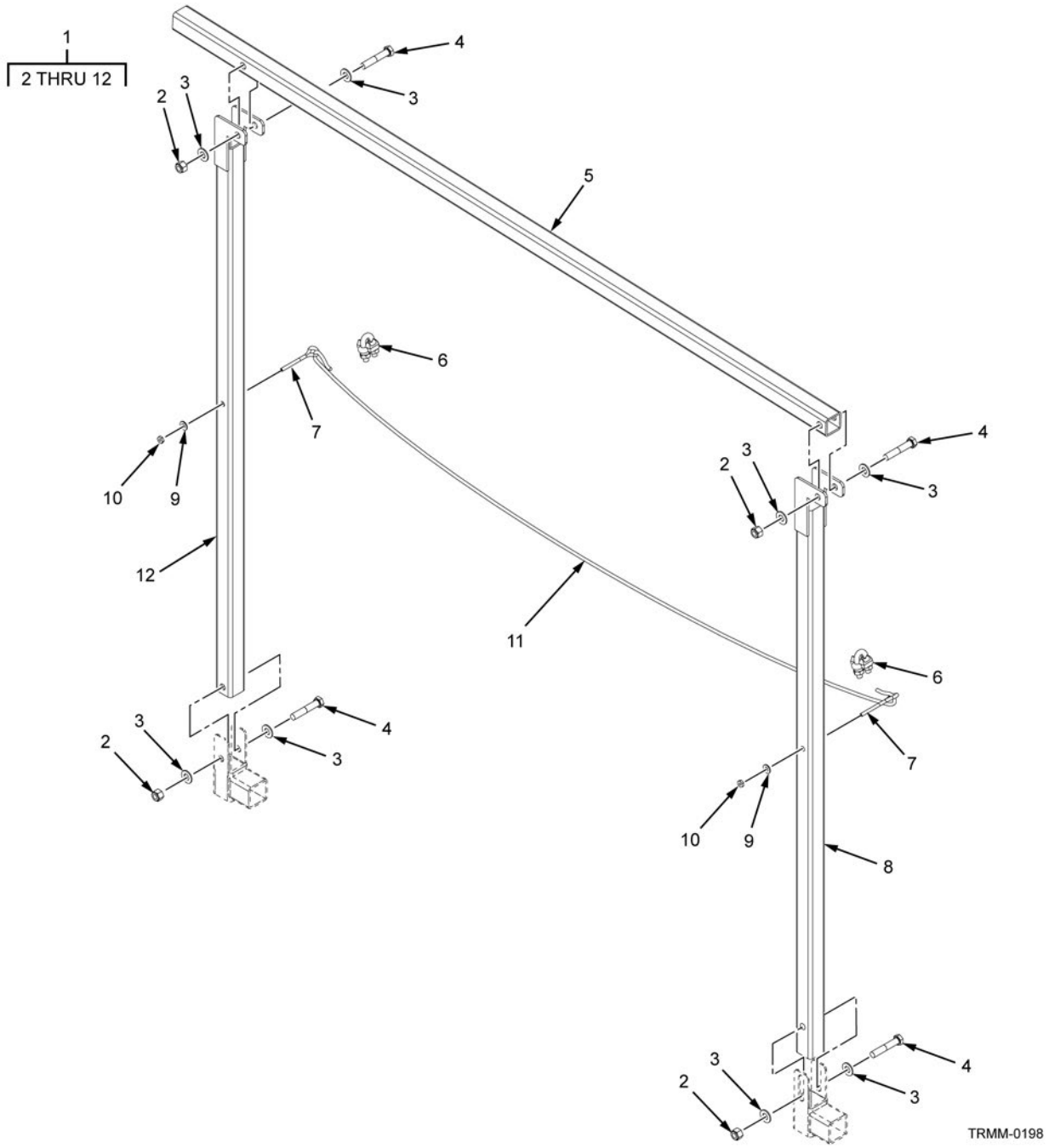


Figure 16. Handrail Assembly.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 0205 HANDRAIL ASSEMBLY	
					FIG. 16. HANDRAIL ASSEMBLY.	
* 1	PAFFF	5340-01-668-6407	55242	1051C-13	HANDRAIL ASSEMBLY	1
* 2	PAFZZ	5310-01-475-9244	39428	91831A127	. NUT,SELF-LOCKING, HEXAGON	4
* 3	PAFZZ	5310-01-665-0457	05047	AEW24X37N000SB8 A31	. WASHER, FLAT	8
* 4	PAFZZ	5306-01-665-0894	05047	AEB02C375B25CH2 A31	. BOLT,MACHINE	4
* 5	PAFZZ	2590-01-662-0774	55242	1051C-13-05	. GRIP, HANDLE (HANDRAIL,HOLD SPAN)	1
* 6	PAFZZ	4030-01-665-8337	1CXX6	S0122-FS05	. WIRE ROPE CLIP	2
7	PAFZZ	5306-01-629-9015	05047	AEB02C250A50CH2 A31	. BOLT,EYE (INCLUDES U-BOLT,CLAMP AND TWO NUTS)	2
* 8	PAFZZ	2540-01-662-1254	55242	1051C-13-02	. GRIP, HANDLE (HANDRAIL POST)	1
* 9	PAFZZ	5310-01-665-0396	05047	AEW24X25N000SB8 A31	. WASHER, FLAT	2
* 10	PAFZZ	5310-01-416-1851	39428	91831A029	. NUT,SELF-LOCKING, HEXAGON	2
11	PAFZZ	4010-01-663-6117	55242	1051C-13-06	. WIRE, ROPE ASSEMBLY SINGLE LEG (ROPE,WIRE)	1
12	PAFZZ	5340-01-663-0055	55242	1051C-13-03	. GRIP, HANDLE (BRACKET, HANDRAIL PIVOT POST)	1
					END OF FIGURE	

MAINTAINER
ROLLER WHEEL ASSEMBLIES

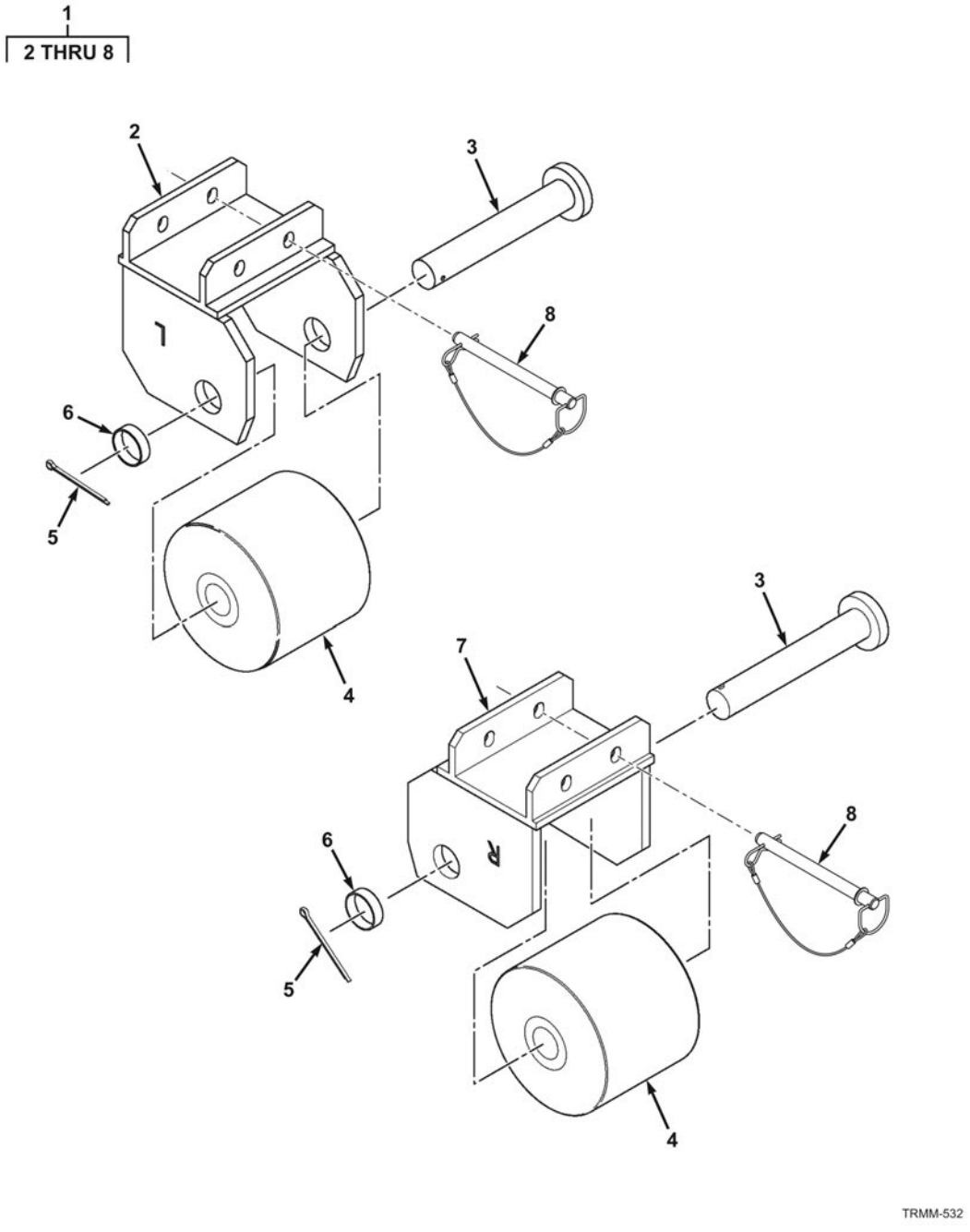


Figure 17. Roller Wheel Assemblies.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 0206 ROLLER WHEEL ASSEMBLIES	
					FIG. 17. ROLLER WHEEL ASSEMBLIES.	
* 1	PAFFF	5340-01-666-0727	55242	1051C-22	ROLLER WHEEL ASSEMBLY, RIGHT (WHEEL,CASTER).....	1
* 1	PAFFF	5340-01-666-0731	55242	1051C-02	ROLLER WHEEL ASSEMBLY, LEFT (WHEEL,CASTER).....	1
2	PAFZZ	5340-01-663-5638	55242	1051C-02-01	. BRACKET, MOUNTING, LEFT.....	1
* 3	PAFZZ	5315-01-662-6883	0SW64	3701-1594	. PIN,STRAIGHT,HEADED.....	1
* 4	PAFZZ	5340-01-666-0689	0SW64	3701-7617 BUFFERS	. ROLLER WHEEL.....	1
* 5	PAFZZ	5315-01-666-0937	05047	AEP02X187C00SB8 A31	. COTTER PIN.....	1
6	PAFZZ	5365-01-663-6913	55242	1051C-02-04	. BUSHING, ROLLER WHEEL PIN.....	1
7	PAFZZ	5340-01-663-5638	55242	1051C-02-01	. BRACKET, MOUNTING, RIGHT.....	1
* 8	PAFZZ	5315-01-690-3525	55242	ISO-1130	. PIN,STRAIGHT HEADED.....	4
					END OF FIGURE	

MAINTAINER
HOSE MOUNT GRATE

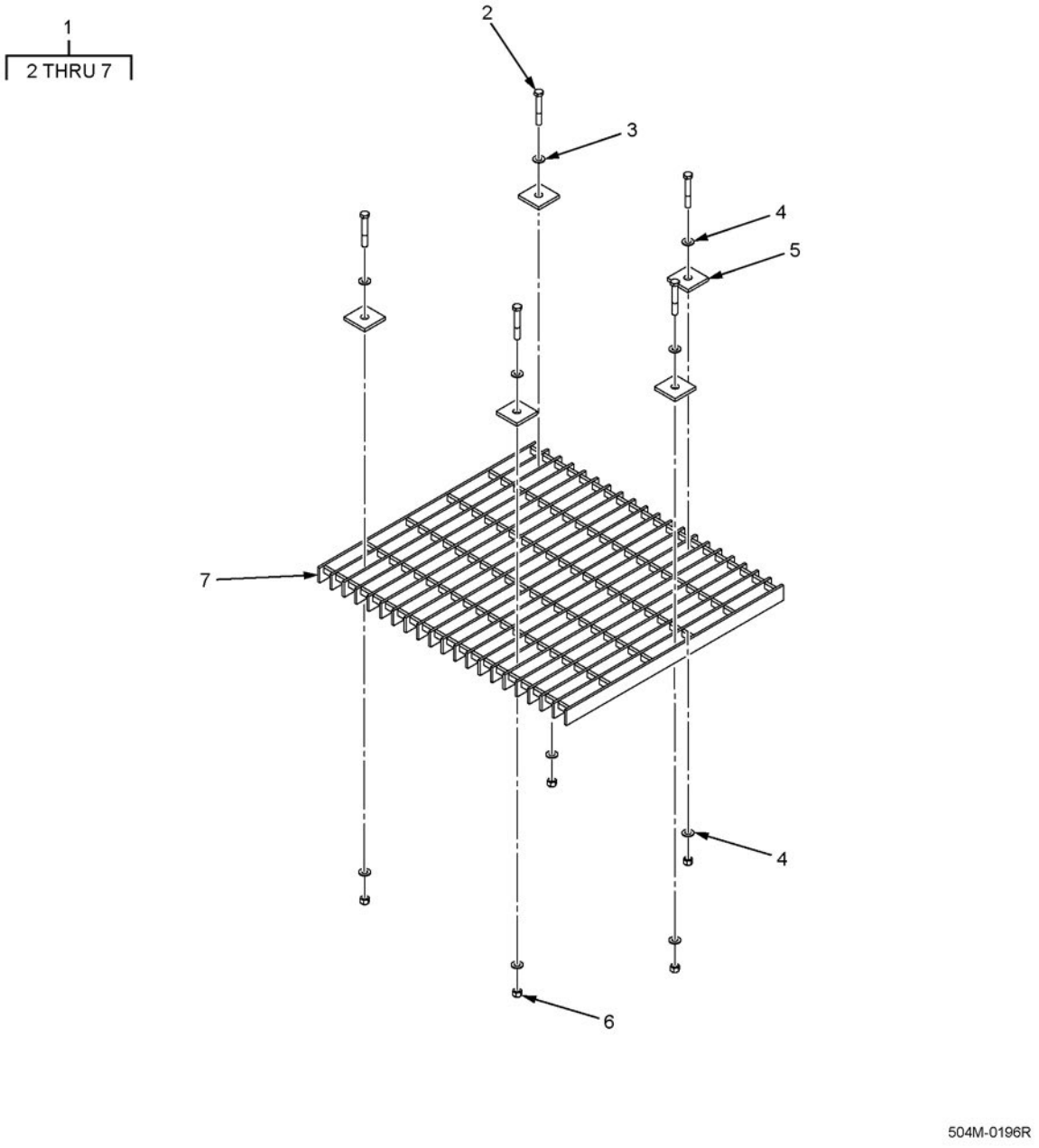


Figure 18. Hose Mount Grate.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 0207 HOSE MOUNT GRATE	
					FIG. 18. HOSE MOUNT GRATE.	
1	XCFZZ		55242	1051C-07	HOSE MOUNT GRATING ASSEMBLY.....	1
* 2	PAFZZ	5306-01-665-3454	05047	AEB02C375B50CH2A31	. BOLT,MACHINE HEXAGON HEAD.....	5
* 3	PAFZZ	5310-01-665-0457	05047	AEW24X37N000SB8A31	. WASHER, FLAT.....	8
* 4	PAFZZ	5310-01-665-0650	05047	AEW11X375000SB8A31	. WASHER,LOCK, INTERNAL TOOTH.....	2
5	PAFZZ	5340-01-663-6303	55242	1051C-01-88	. GRATING CLASP.....	5
* 6	PAFZZ	5310-01-475-9244	39428	91831A127	. NUT,SELF-LOCKING, HEXAGON.....	5
7	PAFZZ	5340-01-663-3997	55242	1051C-07-01	. GRATING, METAL.....	1
					END OF FIGURE	

MAINTAINER
FILTER DECK MOUNT GRATE AND H-BRACKET

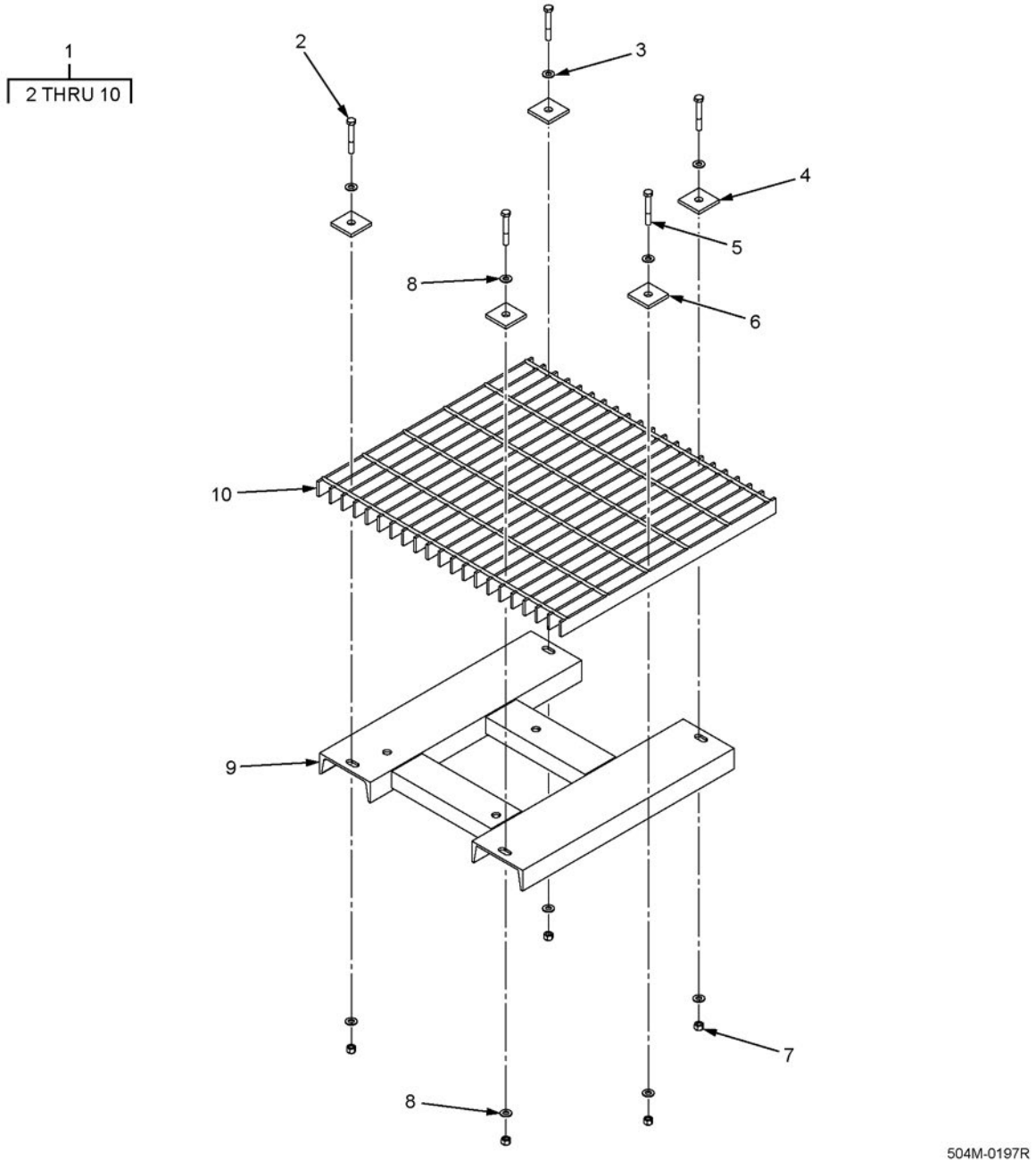


Figure 19. Filter Deck Mount Grate And H-Bracket.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 0208 FILTER DECK MOUNT GRATE AND H-BRACKET	
					FIG. 19. FILTER DECK MOUNT GRATE AND H-BRACKET.	
1	XCFZZ		55242	1051C-21	FILTER DECK MOUNT GRATE AND H-BRACKET ASSEMBLY	1
* 2	PAFZZ	5306-01-664-9226	05047	AEB02C375B75CH2 A31	. BOLT,MACHINE HEXAGON HEAD	4
* 3	PAFZZ	5310-01-665-0457	05047	AEW24X37N000SB8 A31	. WASHER, FLAT	8
4	PAFZZ	5340-01-663-6303	55242	1051C-01-88	. GRATING CLASP	4
* 5	PAFZZ	5306-01-665-3454	05047	AEB02C375B50CH2 A31	. BOLT,MACHINE HEXAGON HEAD	1
* 6	PAFZZ	5340-01-663-6472	55242	1051C-01-112	. GRATING CLASP	1
* 7	PAFZZ	5310-01-475-9244	39428	91831A127	. NUT,SELF-LOCKING, HEXAGON	5
* 8	PAFZZ	5310-01-665-0650	05047	AEW11X375000SB8 A31	. WASHER,LOCK, INTERNAL TOOTH	2
9	PAFZZ	5340-01-663-2573	55242	1051C-23	. BRACKET, MOUNTING (H BRACKET)	1
* 10	PAFZZ	5340-01-663-2765	55242	1051C-21-01	. GRATING, METAL (FILTER DECK MOUNT GRATE)	1
					END OF FIGURE	

MAINTAINER
PUMP MOUNT GRATE

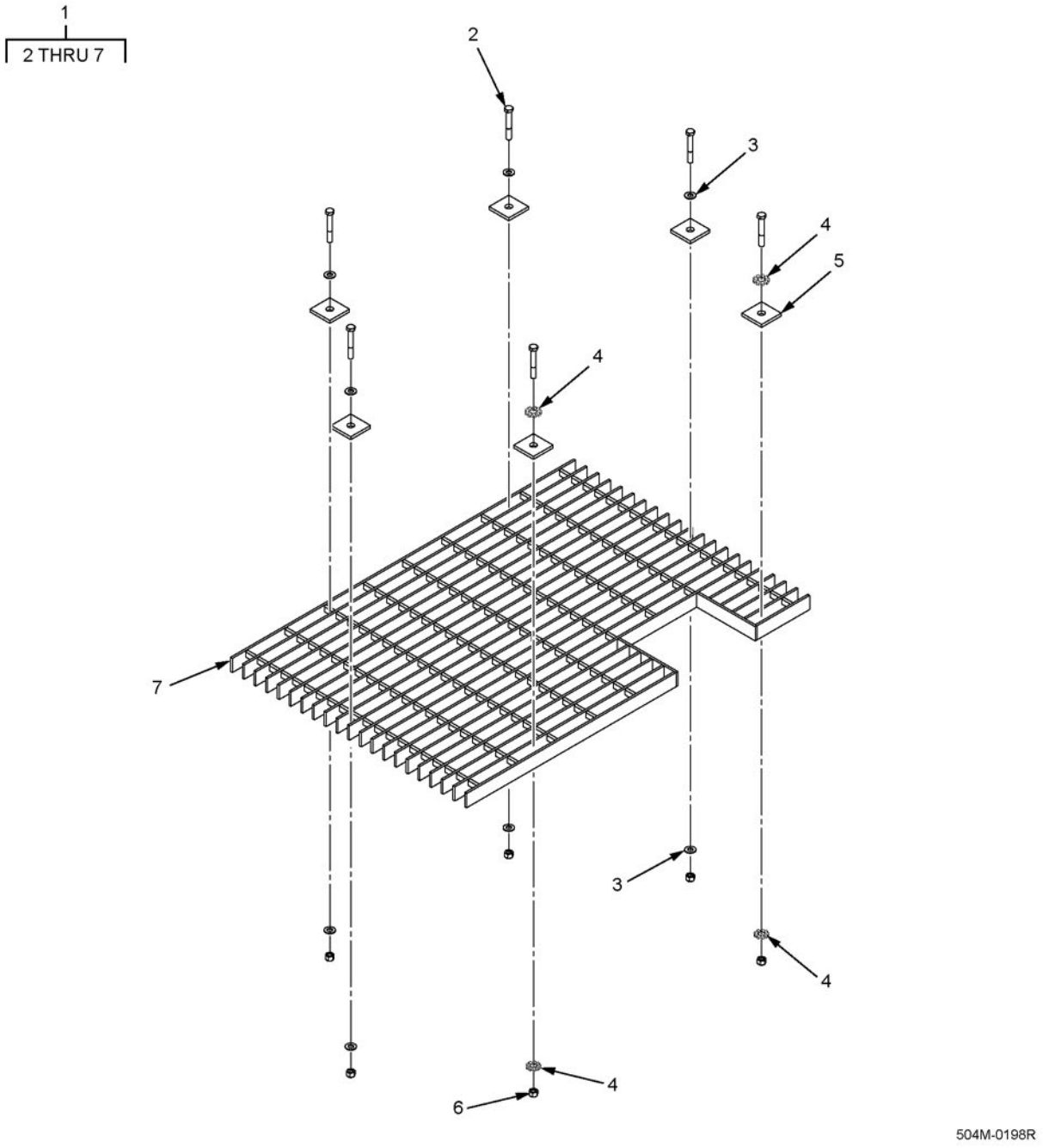


Figure 20. Pump Mount Grate.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 0209 PUMP MOUNT GRATE	
					FIG. 20. PUMP MOUNT GRATE.	
1	XCFZZ		55242	1051C-11	PUMP MOUNT GRATE	1
* 2	PAFZZ	5306-01-665-3454	05047	AEB02C375B50CH2A31	. BOLT,MACHINE HEXAGON HEAD	6
* 3	PAFZZ	5310-01-665-0457	05047	AEW24X37N000SB8A31	. WASHER, FLAT	8
* 4	PAFZZ	5310-01-665-0650	05047	AEW11X375000SB8A31	. WASHER,LOCK, INTERNAL TOOTH	4
5	PAFZZ	5340-01-663-6303	55242	1051C-01-88	. GRATING CLASP	6
* 6	PAFZZ	5310-01-475-9244	39428	91831A127	. NUT,SELF-LOCKING, HEXAGON	6
7	PAFZZ	5340-01-663-2666	55242	1051C-11-01	. GRATING, METAL (PUMP MOUNT GRATING)	1
					END OF FIGURE	

MAINTAINER
CONTROL LEVER ASSEMBLY (V1\V2)

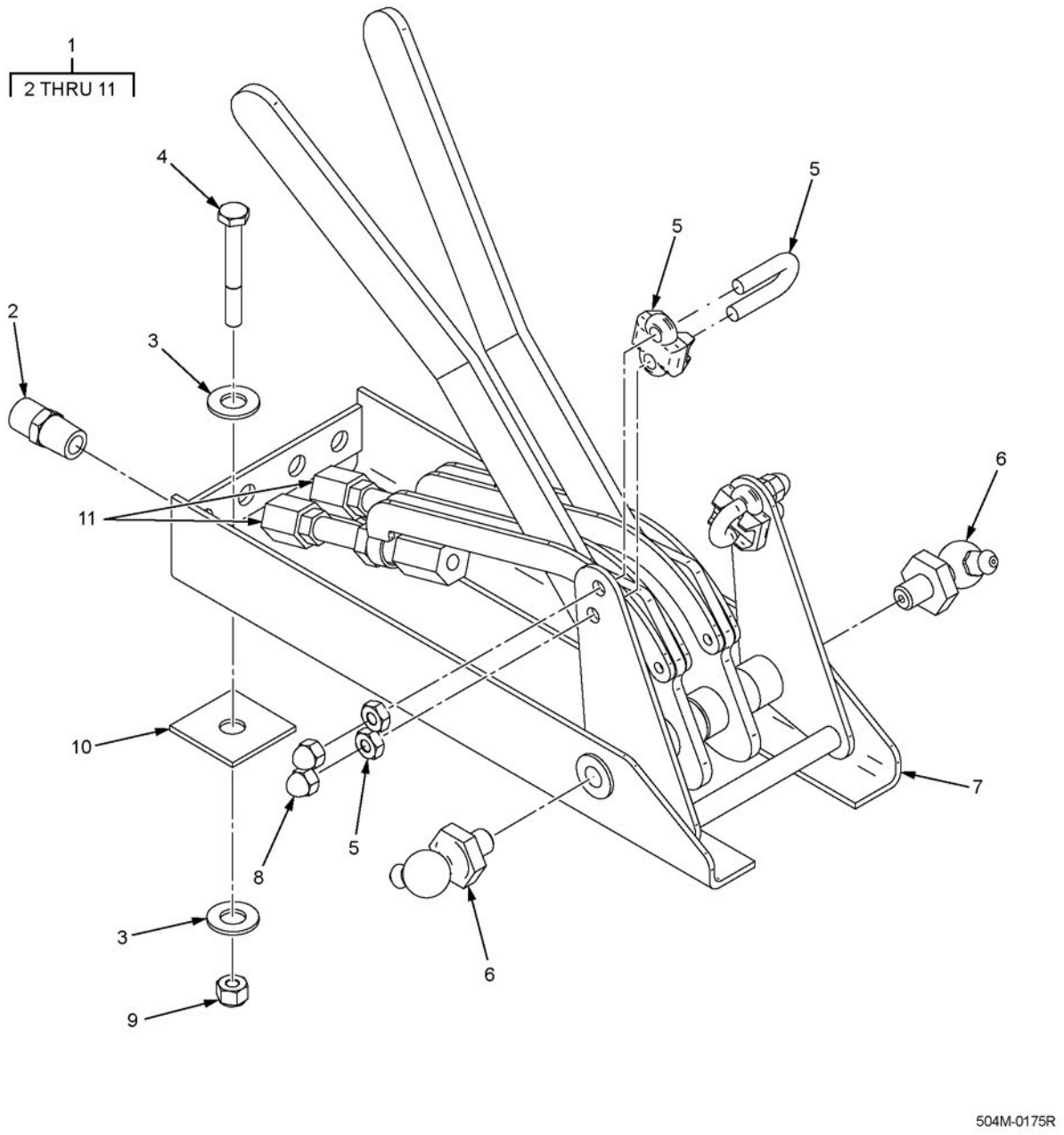


Figure 21. Control Lever Assembly (V1\V2).

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 0302 CONTROL LEVER ASSEMBLY (V1\V2)	
					FIG. 21. CONTROL LEVER ASSEMBLY (V1\V2).	
* 1	PAFZZ	3040-01-665-6577	55242	1051E-11	CONTROL LEVER ASSEMBLY (V1/V2).....	1
* 2	PAFZZ	4730-00-069-1186	81343	SAE J246 6-4 120102BA	. ADAPTER,STRAIGHT,PIPE TO TUBE.....	4
* 3	PAFZZ	5310-01-665-0396	05047	AEW24X25N000SB8 A31	. WASHER, FLAT.....	8
* 4	PAFZZ	5305-01-605-3996	39428	92198A550	. SCREW,CAP,HEXAGON H.....	4
* 5	PAFZZ	4030-01-665-8337	1CXX6	S0122-FS05	. CLAMP,WIRE ROPE,SADDLED.....	2
* 6	PAFZZ	4730-01-662-0017	13226	9Z4873	. GREASE FITTING.....	2
* 7	XAFZZ	3040-01-596-4500	13226	OP9002EY	. LEVER ASSEMBLY, MANUAL CONTROL.....	1
* 8	PAFZZ	5310-01-575-5190	39428	94000A038	. NUT, PLAIN, CAP.....	4
* 9	XDFZZ	5310-01-416-1851	39428	91831A029	. NUT,SELF-LOCKING, HEXAGON.....	4
* 10	PAFZZ	5340-01-663-6303	55242	1051C-01-88	. GRATING CLASP.....	4
* 11	XAFZZ	4930-01-535-5944	13226	20040A001	. CABLE CONTROL ADJUSTMENT.....	2
					END OF FIGURE	

MAINTAINER
CONTROL CABLES

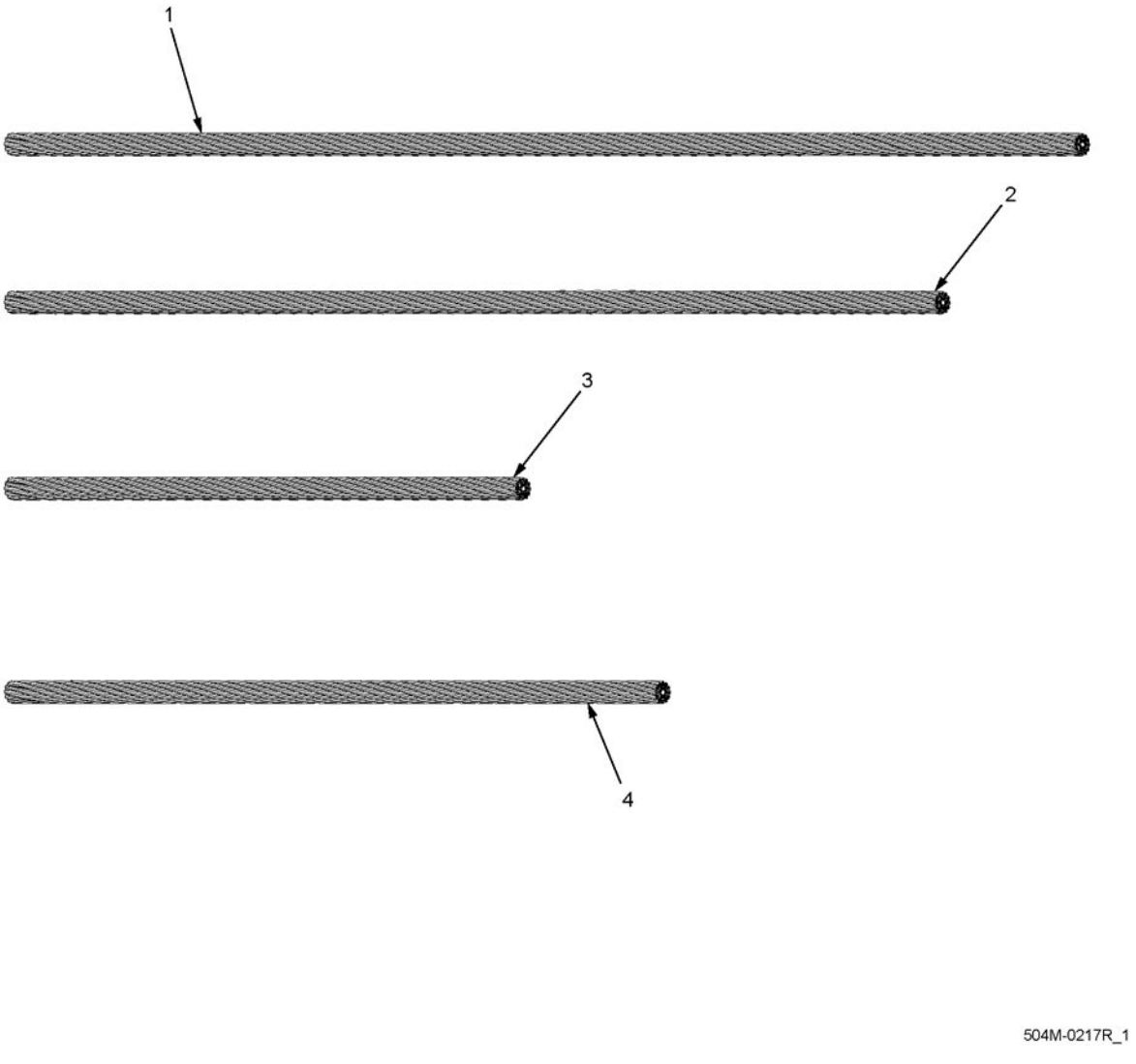


Figure 22. Control Cables.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 0303 CONTROL CABLES	
					FIG. 22. CONTROL CABLES.	
1	PAFZZ	4010-01-663-5727	55242	1051E-02-03	ROPE, WIRE (ACTUATOR CABLE, EMERGENCY, LEFT 282 IN)	1
2	PAFZZ	4010-01-663-5741	55242	1051E-02-04	ROPE, WIRE (ACTUATOR CABLE, EMERGENCY, RIGHT 270 IN)	1
3	PAFZZ	4010-01-663-5692	55242	1051E-02-01	ROPE, WIRE (ACTUATOR CABLE, V1 152 IN)	1
4	PAFZZ	4010-01-663-5716	55242	1051E-02-02	ROPE, WIRE (ACTUATOR CABLE, V2 68 IN)	1
					END OF FIGURE	

MAINTAINER
EMERGENCY LEVERS

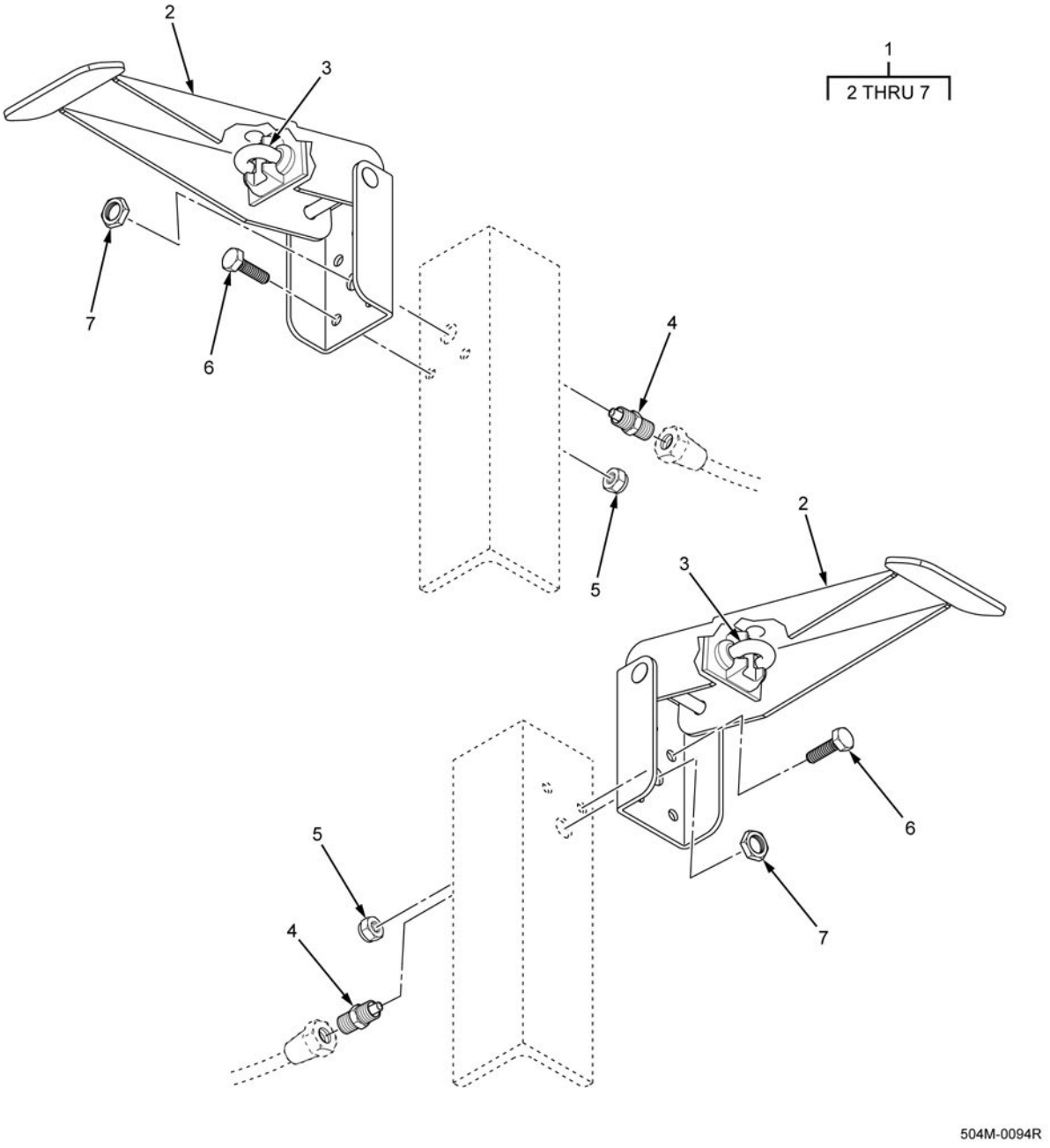


Figure 23. Emergency Levers.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 0304 EMERGENCY LEVERS	
					FIG. 23. EMERGENCY LEVERS.	
* 1	XCFZZ		55242	1051E-12	HAND EMERGENCY LEVER	2
2	PAFZZ	2590-01-054-0253	13226	35603SL	LATCH ASSEMBLY, DUMP	2
* 3	PAFZZ	4030-01-665-8337	1CXX6	S0122-FS05	. WIRE ROPE CLIP (INCLUDES U-BOLT, CLAMP, AND NUTS)	2
4	PAFZZ	4730-00-069-1186	81343	SAE J246 6-4 120102BA	. MALE CONNECTOR	2
* 5	PAFZZ	5310-01-416-1851	39428	91831A029	. NUT,SELF-LOCKING, HEXAGON	4
* 6	PAFZZ	5305-01-665-1749	05047	AEB02C250750CH2 A31	. SCREW,CAP, HEXAGON HEAD	4
* 7	PAFZZ	5310-01-667-3730	80686	P-105-4	. NUT, JAM (PUSH ON NUT)	2
					END OF FIGURE	

MAINTAINER
CONTROL CABLE TUBING ASSEMBLY

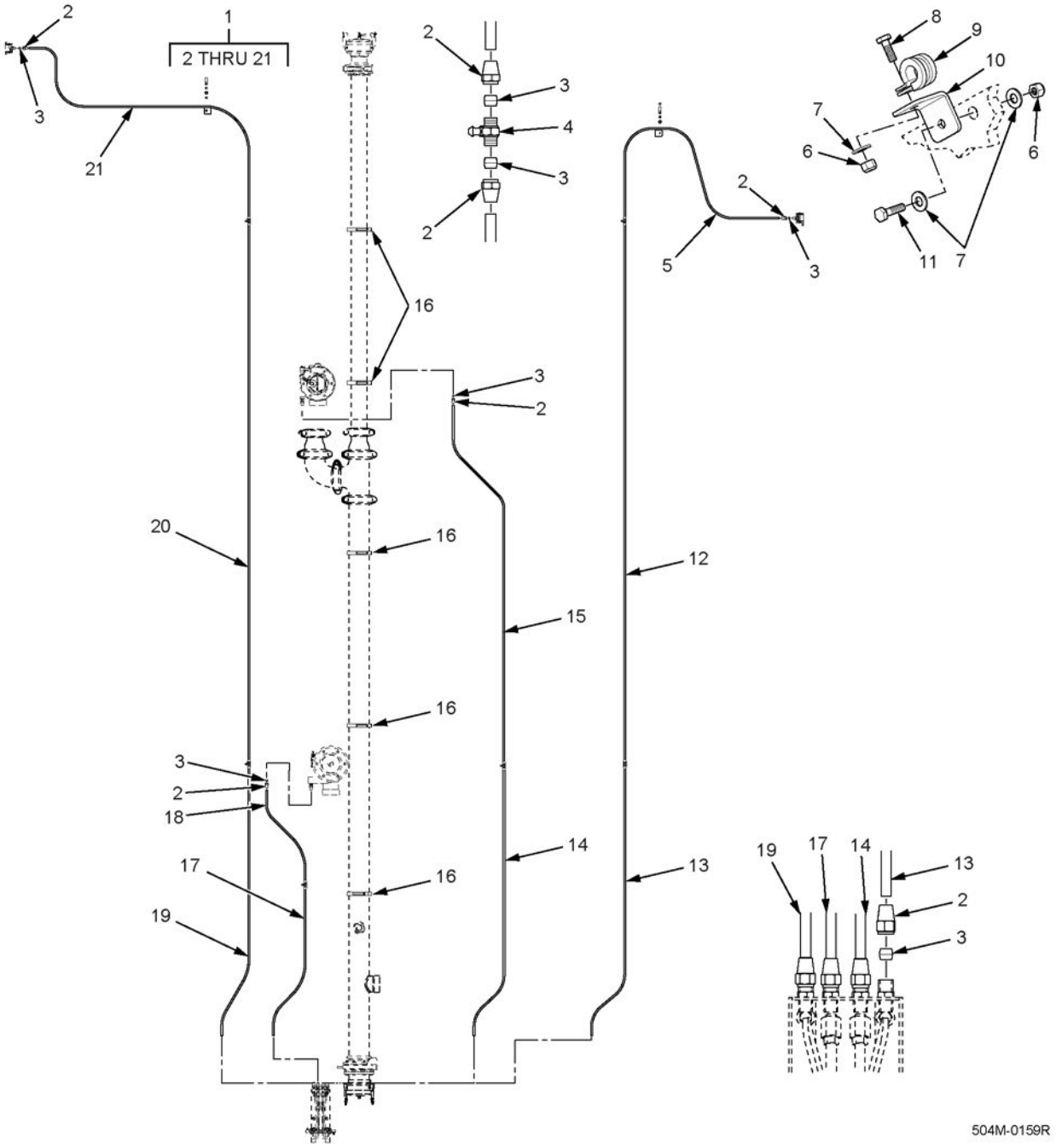


Figure 24. Control Cable Tubing Assembly.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 0305 CONTROL CABLE TUBING ASSEMBLY	
					FIG. 24. CONTROL CABLE TUBING ASSEMBLY.	
1	XCFZZ		55242	1051E	CONTROL CABLE TUBING ASSEMBLY.....	1
2	PAFZZ	4730-00-278-8825	81343	SAE J246 6 120111B	. TUBE NUT.....	20
3	PAFZZ	4730-00-293-7108	81343	SAE J246 6 120115B	. FERRULE.....	20
* 4	PAFZZ	4730-01-665-5837	55242	ISO-048	. GREASE TUBE FITTING.....	6
5	PAFZZ	4710-01-662-6502	55242	1051E-01-06	. TUBE, CABLE ROUTE #6.....	1
* 6	PAFZZ	5310-01-416-1851	39428	91831A029	. NUT,SELF-LOCKING, HEXAGON.....	4
* 7	PAFZZ	5310-01-665-0396	05047	AEW24X25N000SB8 A31	. WASHER, FLAT.....	6
* 8	PAFZZ	5305-01-665-1749	05047	AEB02C250750CH2 A31	. SCREW,CAP, HEXAGON HEAD.....	2
9	PAFZZ	5340-01-560-6872	2V507	3225T63	. CLAMP, LOOP.....	2
10	PAFZZ	5340-01-663-6239	55242	1051C-01-32	. EM HANDLE TUBE CLAMP BRACKET.....	2
* 11	PAFZZ	5306-01-665-3500	05047	AEB02C250A00CH2 A31	. SCREW,CAP, HEXAGON HEAD.....	2
12	PAFZZ	4710-01-662-6463	55242	1051E-01-08	. TUBE, CABLE ROUTE #8.....	1
13	PAFZZ	4710-01-662-6467	55242	1051E-01-10	. TUBE, CABLE ROUTE #10.....	1
14	PAFZZ	4710-01-662-6471	55242	1051E-01-04	. TUBING (TUBE, CABLE ROUTE #4).....	1
15	PAFZZ	4710-01-662-6480	55242	1051E-01-03	. TUBING (TUBE, CABLE ROUTE #5).....	1
16	PAFZZ	4730-01-521-3792	7Z588	200 96 H B	. CLAMP, HOSE.....	5
17	PAFZZ	4710-01-662-5827	55242	1051E-01-01	. TUBE, CABLE ROUTE #1.....	1
18	PAFZZ	4710-01-662-6493	55242	1051E-01-02	. TUBE, CABLE ROUTE #2.....	1
19	PAFZZ	4710-01-662-5813	55242	1051E-01-09	. TUBE, CABLE ROUTE #9.....	1
20	PAFZZ	4710-01-662-6908	55242	1051E-01-07	. TUBE, CABLE ROUTE #7.....	1
21	PAFZZ	4710-01-662-4921	55242	1051E-01-05	. TUBE, CABLE ROUTE #5.....	1
					END OF FIGURE	

MAINTAINER
PRECHECK VALVE (V16) AND LINE

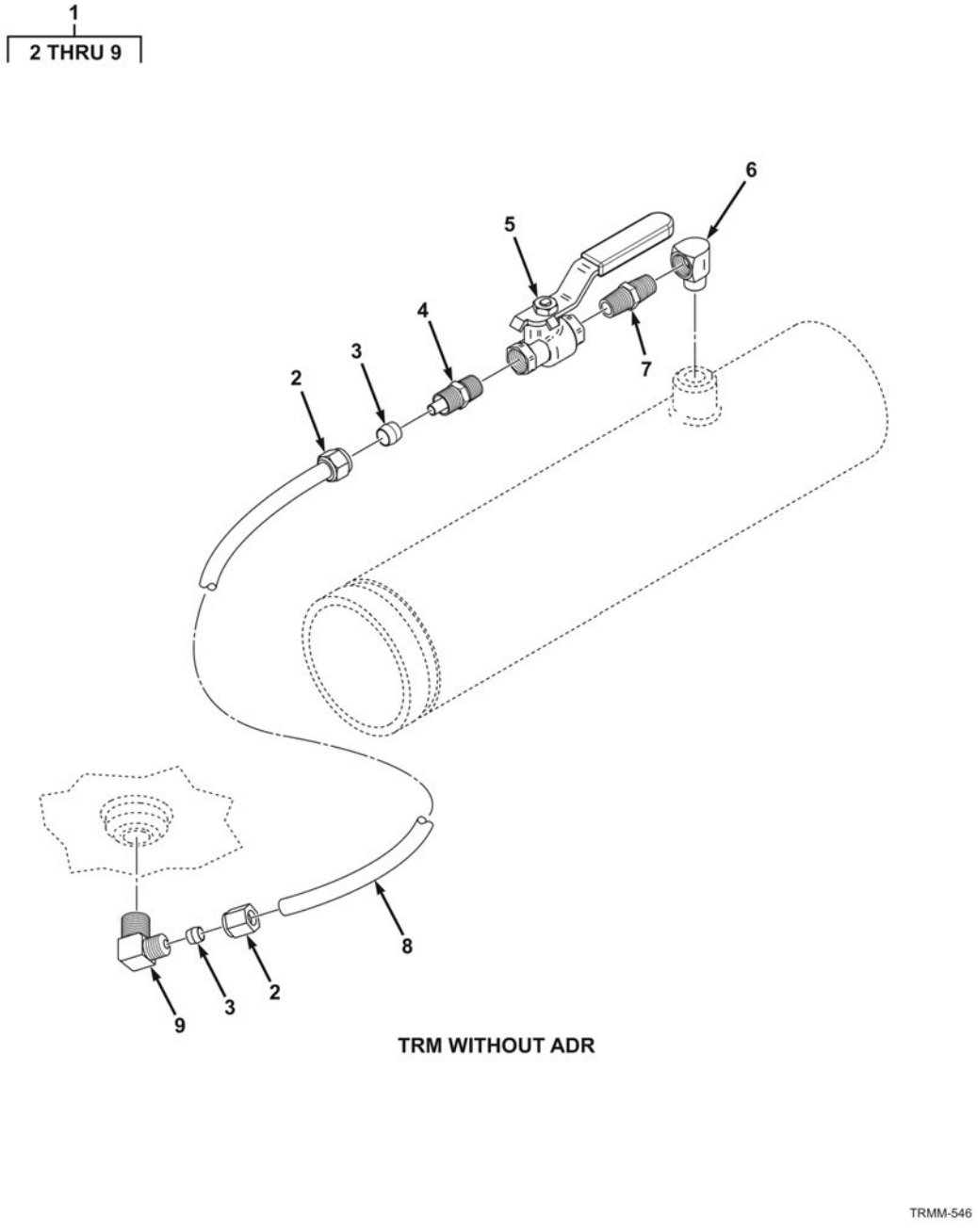


Figure 25. Precheck Valve (V16) and Line (Sheet 1 of 2).

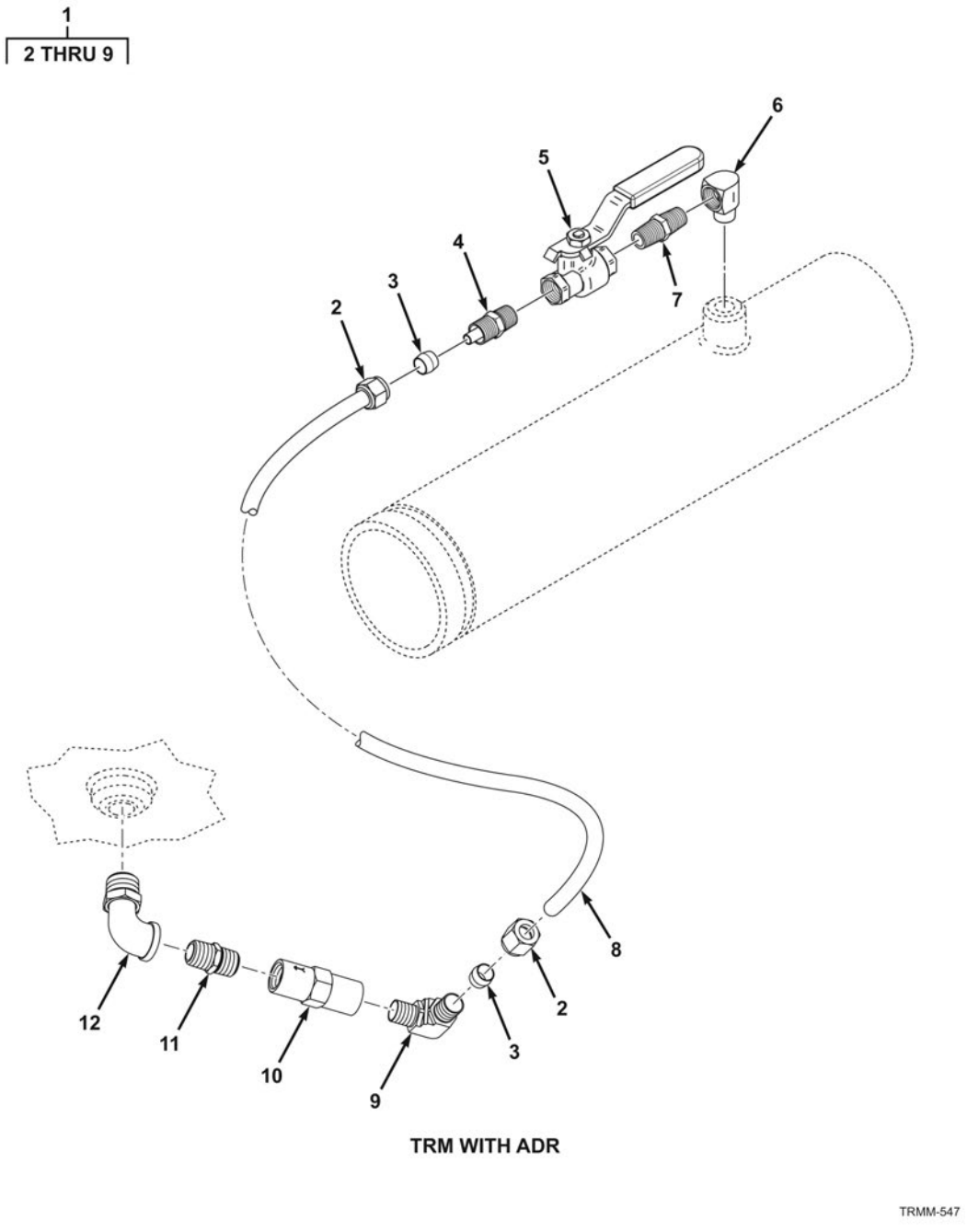


Figure 25. Precheck Valve (V16) and Line (Sheet 2 of 2).

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 0401 PRECHECK VALVE (V16) AND LINE	
					FIG. 25. PRECHECK VALVE (V16) AND LINE.	
1	XCFZZ		55242	1051F-01-24	PRECHECK VALVE (V16) AND LINE ASSEMBLY	1
* 2	PAFZZ	4730-01-048-7873	0U583	SAE J246 6 100110B	. TUBE NUT	2
3	PAFZZ	4730-01-048-5260	81343	SAE J246 6 100115B	. FERRULE	2
* 4	PAFZZ	4730-01-062-2570	81343	SAE J246 6-4 100102BA	. ADAPTER,STRAIGHT,PIPE TO TUBE (CONNECTOR)	1
* 5	PAFZZ	4820-01-665-4306	82666	T-255-FB-P 1/4	. VALVE, BALL, 1/4	1
* 6	PAFZZ	4730-00-278-4824	81343	4-4 140239B	. ELBOW, PIPE	1
* 7	PAFZZ	4730-00-277-8289	93061	216P-4	. NIPPLE MALE	1
8	PAFZZ	4710-01-662-6867	55242	1051F-21-08	. FLEX LINE	1
9	PAFZZ	4730-01-134-3563	81343	SAE J246 6-8 100202BA	. ELBOW,STREET,BRASS	1
* 10	PAFZZ	4820-01-696-3889	55242	ISO-1532	VALVE, CHECK (V19, 3/8 IN CHECK VALVE)	1
* 11	PAFZZ	4730-00-249-9714	93061	216P-6	NIPPLE,PIPE (3/8 IN HEX NIPPLE)	1
* 12	PAFZZ	4730-00-278-4822	39428	4429K152	ELBOW, PIPE (3/8 INCH STREET ELBOW)	1
					END OF FIGURE	

MAINTAINER
ELECTRIC MOTOR ASSEMBLY

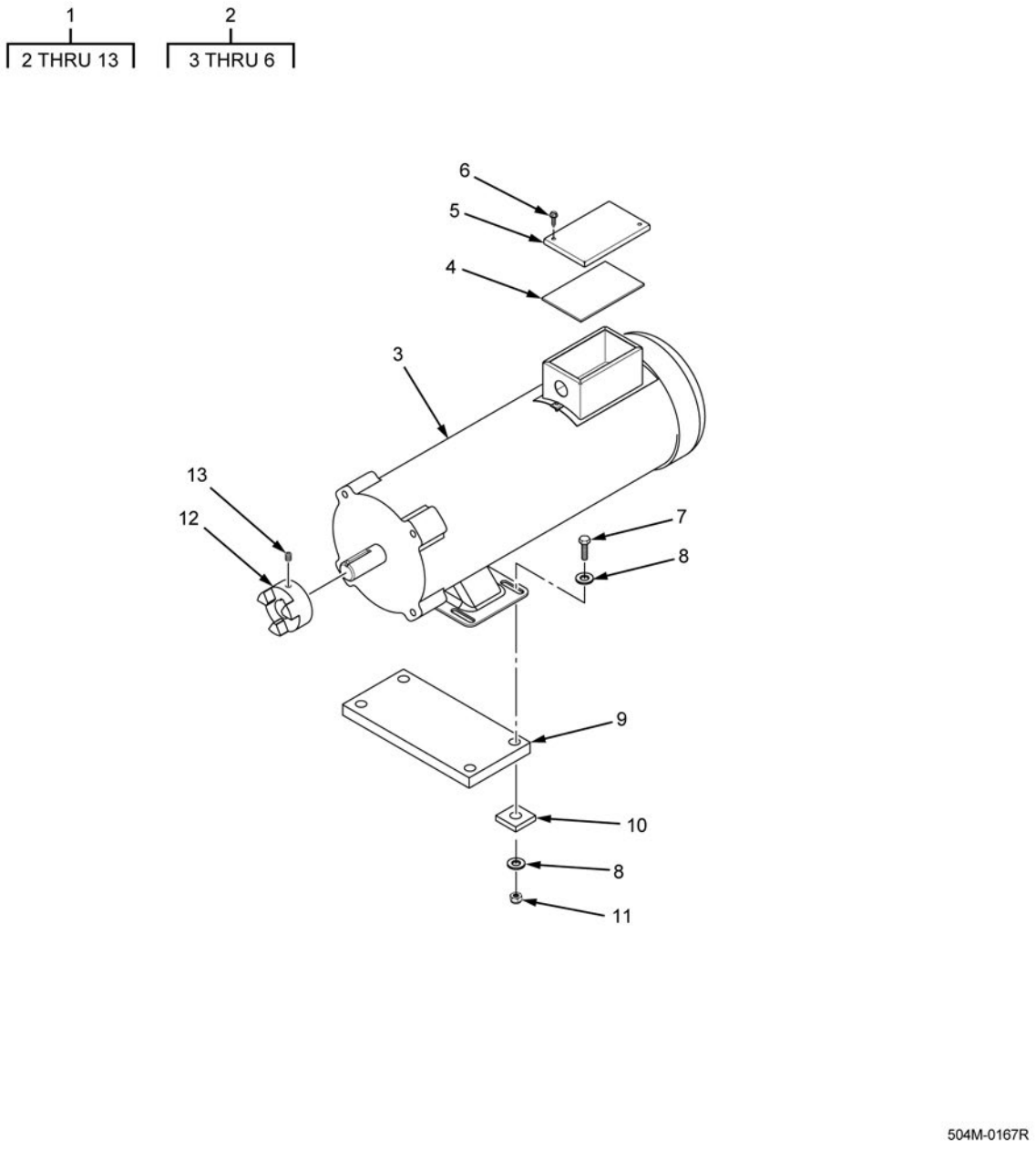


Figure 26. Electric Motor Assembly.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 0402 ELECTRIC MOTOR ASSEMBLY	
					FIG. 26. ELECTRIC MOTOR ASSEMBLY.	
1	XCFZZ		55242	1051F-22	MOTOR, DC	1
2	PAFZZ	6105-01-662-6575	55242	1051F-22-10	. 24 VDC ELECTRIC MOTOR W/ KEY	1
3	XAFZZ		56065	109256.00	. . 24 VDC ELECTRIC MOTOR	1
* 4	PAFZZ	5330-01-663-2736	55242	1051F-22-04	. . ELECTRIC BOX CAP GASKET	1
* 5	PAFZZ	5975-01-662-2806	55242	1051F-22-01	. . CONDUIT BOX COVER	1
* 6	PAFZZ	5305-01-515-3147	39428	90316A537	. . SCREW,ASSEMBLED WASHER	2
* 7	PAFZZ	5306-01-665-3798	05047	AEB02C250C25CH2A31	. BOLT,MACHINE	4
* 8	PAFZZ	5310-01-665-0396	05047	AEW24X25N000SB8A31	. WASHER, FLAT	8
9	PAFZZ	5340-01-663-0028	55242	1051F-01-15	. PLATE, MOUNTING	1
10	PAFZZ	5340-01-663-6303	55242	1051C-01-88	. GRATING CLASP	4
* 11	PAFZZ	5310-01-416-1851	39428	91831A029	. NUT,SELF-LOCKING, HEXAGON	4
12	PAFZZ	3010-01-522-4575	07524	906147	. COUPLING HALF, SHAFT (LOVEJOY COUPLING)	1
13	PAFZZ	5305-01-517-6004	39428	91375A576	. SETSCREW	1
					END OF FIGURE	

MAINTAINER
PUMP ASSEMBLY

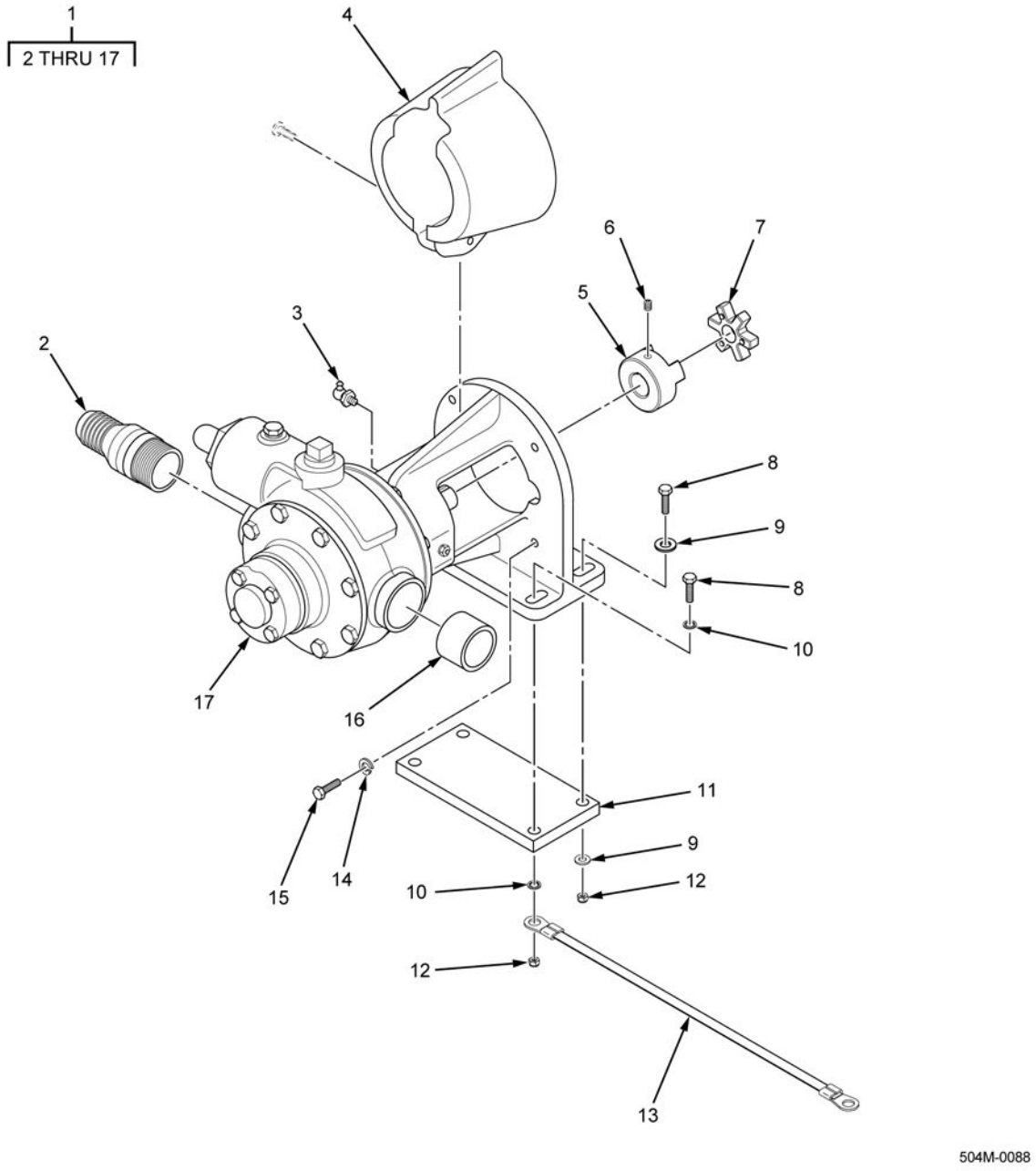


Figure 27. Pump Assembly.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 0403 PUMP ASSEMBLY	
					FIG. 27. PUMP ASSEMBLY.	
1	XCFZZ		55242	1051F-27	PUMP ASSEMBLY	1
2	PAFZZ	4730-01-244-4664	72661	RST20	. FITTING,HOSE BARBED	1
3	PAFZZ	4730-01-662-5089	55242	ISO-1133	. FITTING, LUBRICATION	1
4	PCFZZ	3010-01-662-5843	07524	804120	. COUPLING GUARD W/SCREW	1
5	PAFZZ	3010-01-522-4575	07524	906147	. COUPLING HALF, SHAFT (LOVEJOY COUPLING)	1
6	PAFZZ	5305-01-517-6004	39428	91375A576	. SCREW, SET	1
* 7	PAFZZ	3010-01-675-5222	75655	L099/100	. COUPLING SPIDER, HYT	1
* 8	PAFZZ	5306-01-664-9226	05047	AEB02C375B75CH2A31	. BOLT,MACHINE HEXAGON HEAD	4
* 9	PAFZZ	5310-01-665-0457	05047	AEW24X37N000SB8A31	. WASHER, FLAT	6
* 10	PAFZZ	5310-01-665-0650	05047	AEW11X375000SB8A31	. WASHER,LOCK, INTERNAL TOOTH	2
11	PAFZZ	5340-01-663-6502	55242	1051C-01-43	. MOUNTING BRACKET	1
* 12	PAFZZ	5310-01-475-9244	39428	91831A127	. NUT,SELF-LOCKING, HEXAGON	4
13	PAFZZ	5999-01-662-2601	55242	1051G-12	. STRIP, ELECTRICAL GROUND STRAP	1
* 14	PAFZZ	5310-01-665-7753	05047	AEW07X375000SB8A31	. WASHER, LOCK	4
* 15	PAFZZ	5306-01-665-1752	05047	AEB02C375A50CH2A31	. SCREW,CAP, HEXAGON HEAD	4
16	PAFZZ	4730-01-662-7249	55242	1051F-01-20	. NIPPLE, PIPE	1
* 17	PAFZZ	4320-01-665-3794	55242	1051F-40	. PUMP, ROTARY (PUMP W/ KEY)	1
					END OF FIGURE	

MAINTAINER
VALVE ADAPTER ASSEMBLY

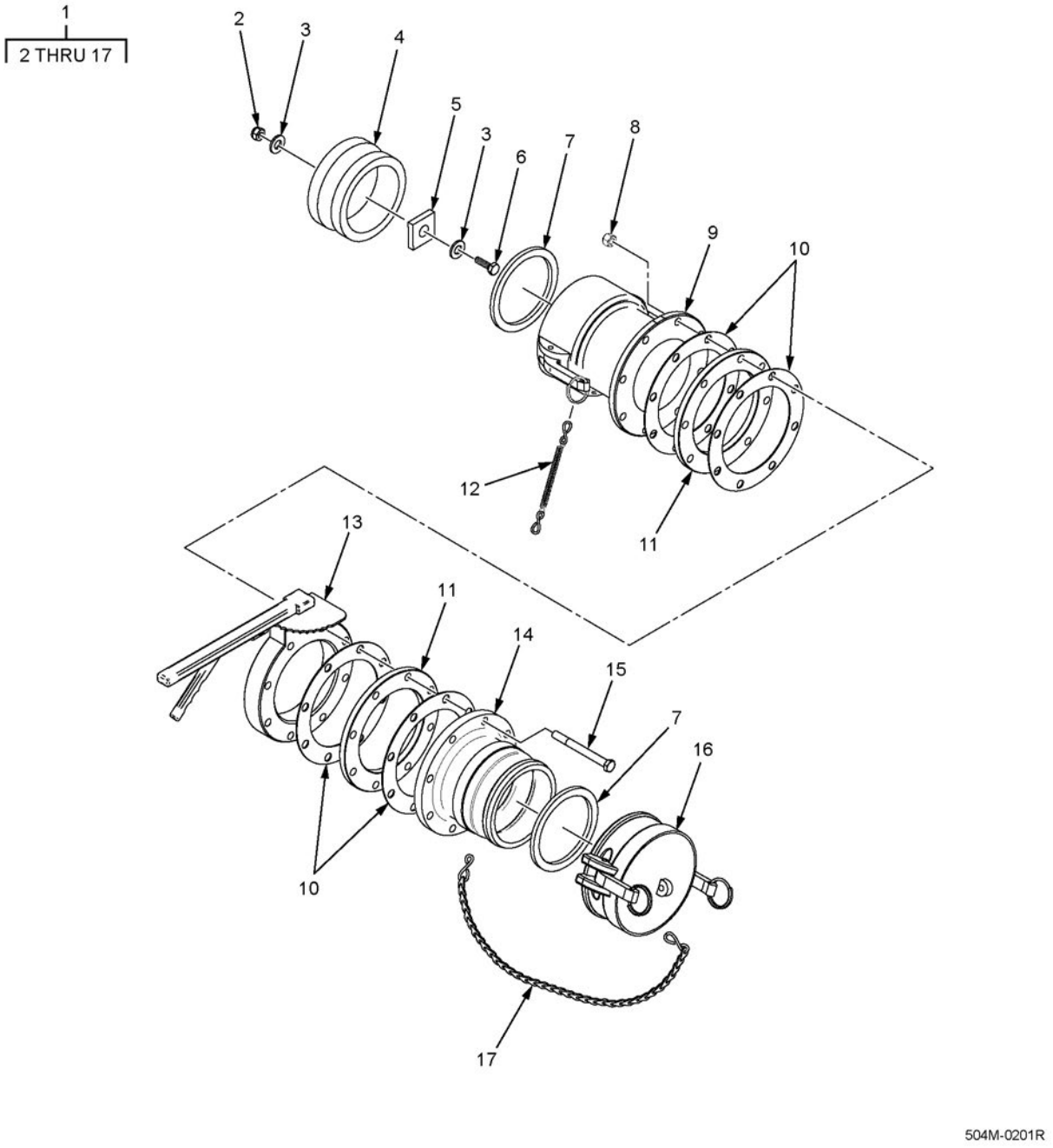


Figure 28. Valve Adapter Assembly.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 0404 VALVE ADAPTER ASSEMBLY	
					FIG. 28. VALVE ADAPTER ASSEMBLY.	
1	PAOFF	4730-01-656-1530	55242	1051F-18	ASSEMBLY, CAMLOCK	1
* 2	PAFZZ	5310-01-475-9155	39428	91831A137	. NUT,SELF-LOCKING, HEXAGON	1
* 3	PAFZZ	5310-01-665-0387	05047	AEW24X50N000SB8A31	. WASHER, FLAT	2
4	PAFZZ	4730-01-663-7273	55242	ISO-808	. CAMLOCK MOUNT BOSS	1
5	PAFZZ	5975-01-662-2352	55242	1051F-01-33	. CLASP, TIE-DOWN	1
* 6	PAFZZ	5305-01-665-1750	05047	AEB02C500A75CH2A31	. SCREW,CAP,HEXAGON HEAD (BOLT)	1
7	PAOFF	5330-00-899-4509	58536	AA59326-G-9	. GASKET, CAMLOCK 4 IN	2
* 8	PAFZZ	5310-01-475-9244	39428	91831A127	. NUT,SELF-LOCKING, HEXAGON	8
9	PAFZZ	3010-01-663-6065	55242	1051F-36	. COUPLER, CAMLOCK	1
10	PCFZZ	5330-01-577-5200	72661	400-G-BU	. GASKET	4
11	PAFZZ	4730-01-584-1662	3HMC9	20189D	. FLANGE, ALUMINUM	2
12	PAFZZ	5340-01-663-6015	55242	1051F-17-01	. STRAP, CAMLOCK SPRING	1
13	PAFZZ	4810-01-662-0222	13226	WD404ALB	. VALVE, BUTTERFLY	1
14	PAFZZ	4730-01-662-5846	4UE86	633LAT-AL40	. CAMLOCK ADAPTER	1
* 15	PAFZZ	5306-01-664-9306	05047	AEB02C375C75CH2A31	. BOLT,MACHINE HEXAGON HEAD	8
16	PAFZZ	5340-01-663-4293	55242	1051F-36-01	. CAMLOCK DUST CAP	1
17	PAFZZ	4010-01-663-6041	55242	1051F-18-01	. SASH CHAIN W/ S-HOOKS	1

END OF FIGURE

MAINTAINER
TEE ASSEMBLY

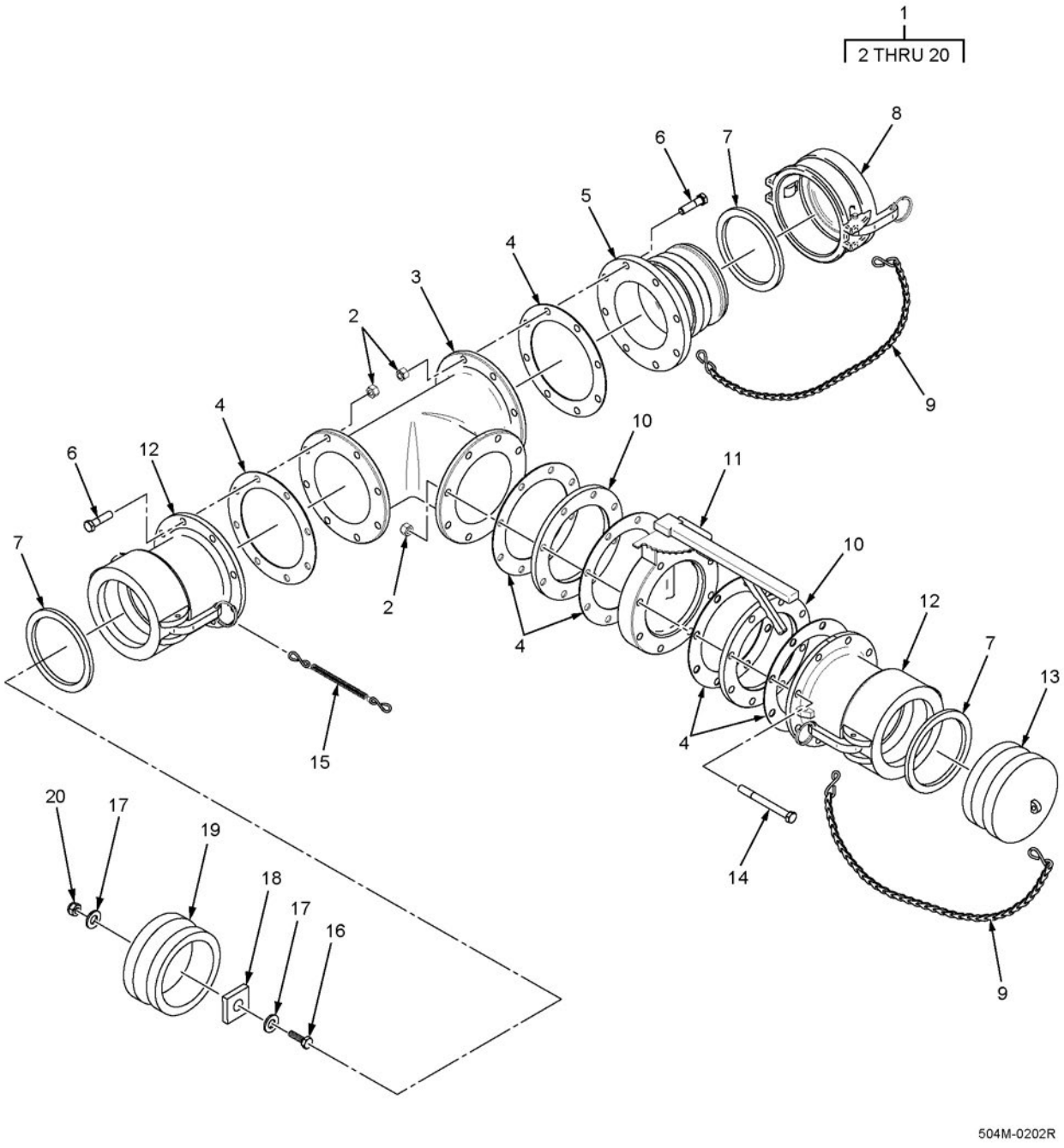


Figure 29. Tee Assembly.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 0405 TEE ASSEMBLY	
					FIG. 29. TEE ASSEMBLY.	
1	PAOFF	4730-01-656-1910	55242	1051F-17	TEE ASSEMBLY	1
* 2	PAFZZ	5310-01-475-9244	39428	91831A127	. NUT,SELF-LOCKING, HEXAGON	24
3	PAFZZ	4730-01-662-4619	4UE86	320F-K184-C	. TEE, FLANGE	1
4	PCFZZ	5330-01-577-5200	72661	400-G-BU	. GASKET	6
5	PAFZZ	4730-01-662-5846	4UE86	633LAT-AL40	. CAMLOCK ADAPTER	1
* 6	PAFZZ	5306-01-665-1752	05047	AEB02C375A50CH2A31	. SCREW,CAP, HEXAGON HEAD	16
7	PCOZZ	5330-00-899-4509	58536	AA59326-G-9	. GASKET, CAMLOCK, 4 IN	3
* 8	PAFZZ	5340-01-666-0925	72661	400-DC-AL	. CAP,PROTECTIVE,DUST AND MOISTURE SEAL	1
9	PAFZZ	4010-01-663-6041	55242	1051F-18-01	. SASH CHAIN W/ S-HOOKS	2
10	PAFZZ	4730-01-584-1662	3MHC9	20189D	. FLANGE, ALUMINUM	2
11	PAFZZ	4810-01-662-0222	13226	WD404ALB	. VALVE, BUTTERFLY	1
* 12	PAFZZ	4730-01-665-4292	72661	400-DLT-AL	. COUPLING HALF,QUICK DISCONNECT	2
* 13	PAFZZ	4730-01-665-2006	72661	400-DP-AL	. PLUG,QUICK DISCONNECT	1
* 14	PAFZZ	5306-01-664-9306	05047	AEB02C375C75CH2A31	. BOLT,MACHINE HEXAGON HEAD	8
15	PAFZZ	5340-01-663-6015	55242	1051F-17-01	. STRAP, CAMLOCK SPRING	1
* 16	PAFZZ	5305-01-665-1750	05047	AEB02C500A75CH2A31	. SCREW,CAP,HEXAGON HEAD (BOLT)	1
* 17	PAFZZ	5310-01-665-0387	05047	AEW24X50N000SB8A31	. WASHER, FLAT	2
18	PAFZZ	5975-01-662-2352	55242	1051F-01-33	. CLASP, TIE DOWN	1
19	PAFZZ	4730-01-663-7273	55242	ISO-808	. CAMLOCK MOUNT BOSS	1
* 20	PAFZZ	5310-01-475-9155	39428	91831A137	. NUT,SELF-LOCKING, HEXAGON	1
					END OF FIGURE	

MAINTAINER
FLEXIBLE HOSES

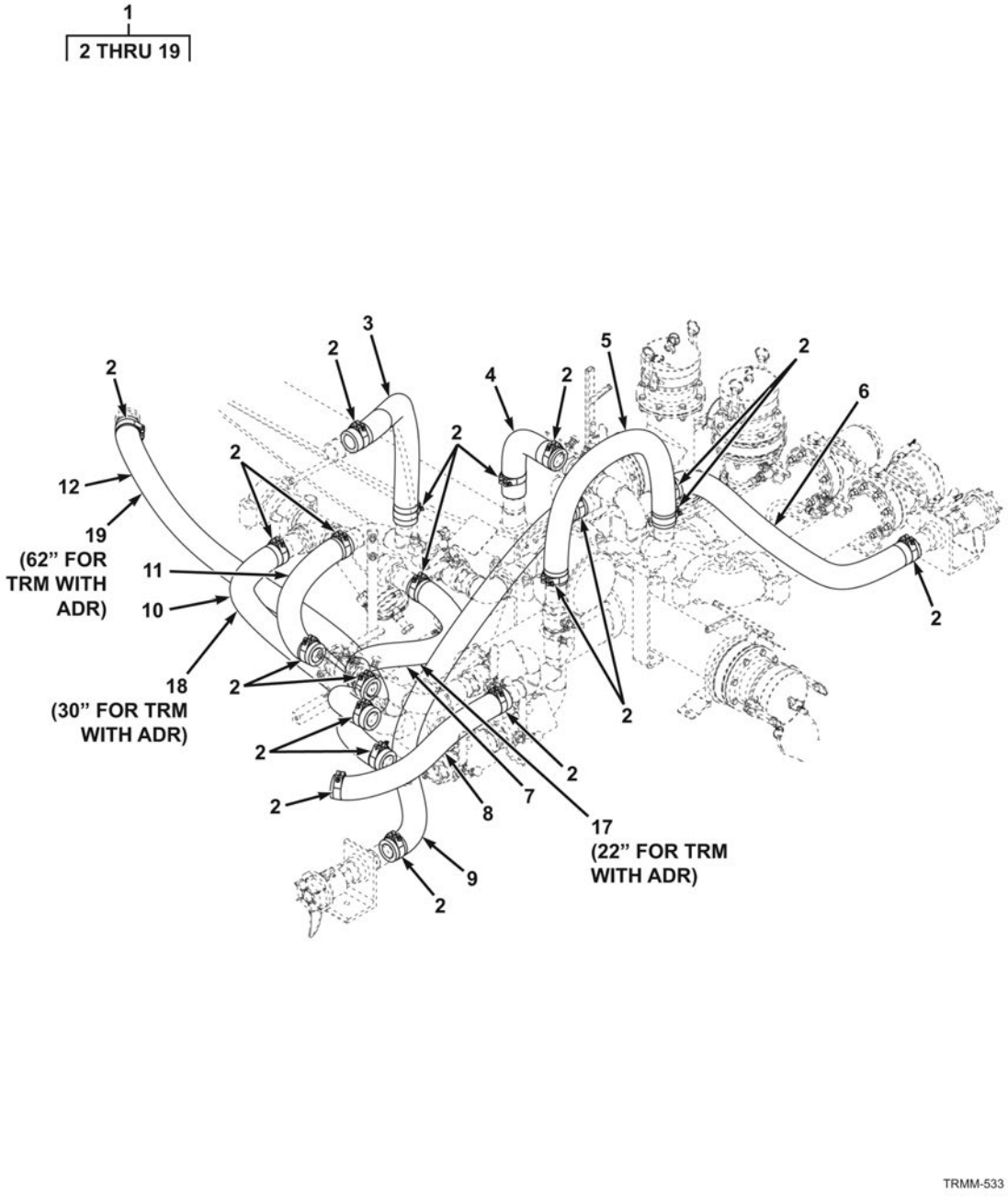
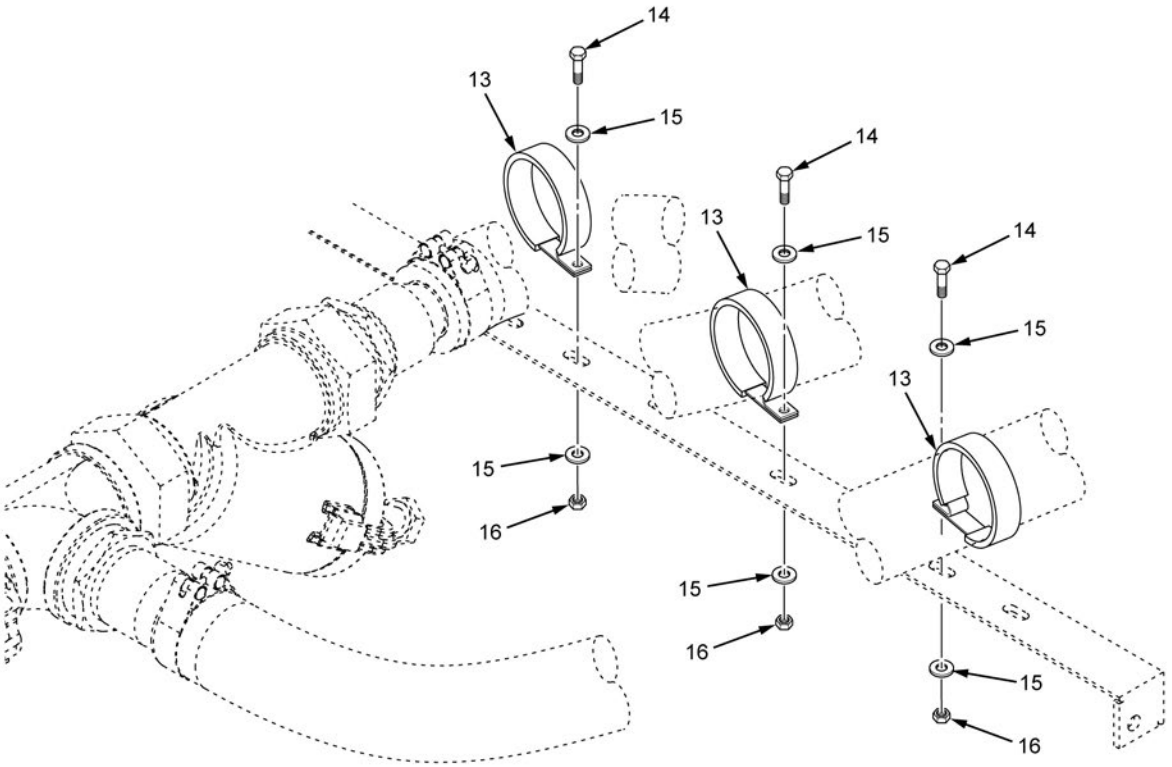


Figure 30. Flexible Hoses (Sheet 1 of 2).



SOME ITEMS
HIDDEN FOR
CLARITY

504M-0227

Figure 30. Flexible Hoses (Sheet 2 of 2).

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 0406 FLEXIBLE HOSES	
					FIG. 30. FLEXIBLE HOSES.	
1	XCFZZ		55242	1051F-06	FLEXIBLE HOSES	1
* 2	PAFZZ	4730-01-671-9517	81646	300510200	. CLAMP, HOSE (INCLUDES CLAMP AND LOCKNUTS)	20
3	PCFZZ	4720-01-662-3723	55242	1051F-06-02	. HOSE, NONMETALLIC (FLEX HOSE, 42 IN)	1
4	PCFZZ	4720-01-662-4314	55242	1051F-06-12	. HOSE, NONMETALLIC (FLEX HOSE, 17 IN)	1
5	PCFZZ	4720-01-662-6861	55242	1051F-06-11	. HOSE, NONMETALLIC (FLEX HOSE, 29 IN)	1
6	PCFZZ	4720-01-662-4316	55242	1051F-06-09	. HOSE, NONMETALLIC (FLEX HOSE, 32 IN)	1
* 7	PCFZZ	4720-01-662-3717	55242	1051F-06-10	. HOSE, NONMETALLIC (FLEX HOSE, 29 IN)	1
* 8	PCFZZ	4720-01-662-3729	55242	1051F-06-04	. HOSE, NONMETALLIC (FLEX HOSE, 24 IN)	1
9	PCFZZ	4720-01-662-3332	55242	1051F-06-08	. HOSE, NONMETALLIC (FLEX HOSE, 56 IN)	1
10	PCFZZ	4720-01-662-4308	55242	1051F-06-13	. HOSE, NONMETALLIC (FLEX HOSE, 44 IN)	1
* 11	PCFZZ	4720-01-662-4311	55242	1051F-06-03	. HOSE, NONMETALLIC (FLEX HOSE, 20 IN)	1
* 12	PCFZZ	4720-01-662-4265	55242	1051F-06-06	. HOSE, NONMETALLIC (FLEX HOSE, 72 IN)	1
* 13	PCFZZ	5340-01-662-7472	02WC8	STAR-SS-32HT-M1	. CLAMP, CUSHIONED	3
* 14	PAFZZ	5306-01-665-3500	05047	AEB02C250A00CH2A31	. BOLT,MACHINE	3
* 15	PAFZZ	5310-01-665-0396	05047	AEW24X25N000SB8A31	. WASHER, FLAT	6
* 16	PAFZZ	5310-01-416-1851	39428	91831A029	. NUT,SELF-LOCKING, HEXAGON	3
* 17	PCFZZ	4720-01-706-6693	55242	1051F-06-06-ADR	. HOSE,NONMETALLIC (FLEX HOSE, 22" FOR TRM WITH ADR)	1
* 18	PCFZZ	4720-01-706-6690	55242	1051F-06-13-ADR	. HOSE,NONMETALLIC (FLEX HOSE, 30" FOR TRM WITH ADR)	1
* 19	PCFZZ	4720-01-706-6701	55242	1051F-06-10-ADR	. HOSE,NONMETALLIC (FLEX HOSE, 62" FOR TRM WITH ADR)	1
					END OF FIGURE	

MAINTAINER
LEFT SIDE PIPING ASSEMBLY

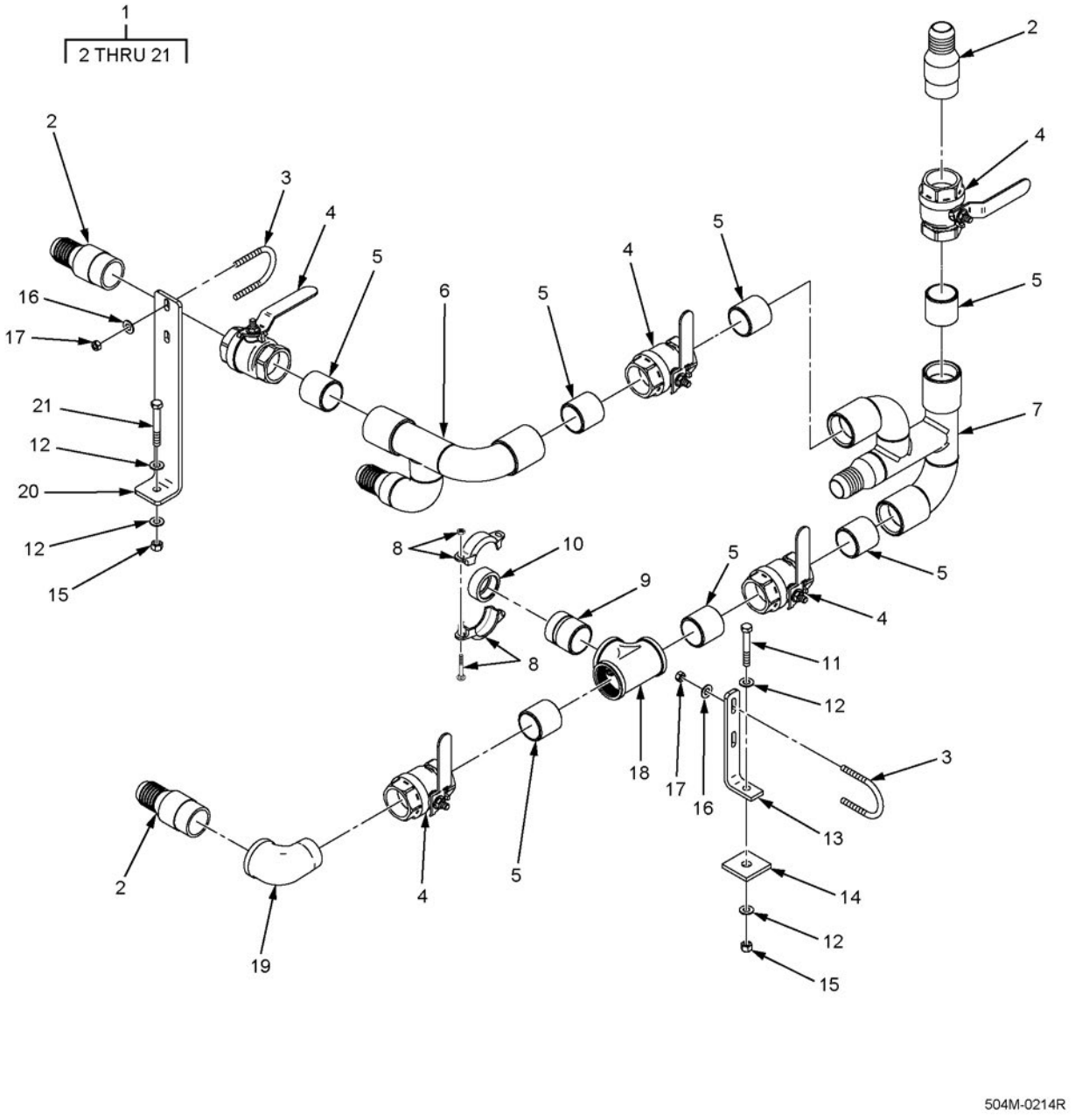


Figure 31. Left Side Piping Assembly.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 0407 LEFT SIDE PIPING ASSEMBLY	
					FIG. 31. LEFT SIDE PIPING ASSEMBLY.	
* 1	PAFFF	4710-01-665-5327	55242	1051F-35	LEFT SIDE PIPING ASSEMBLY	1
2	PAFZZ	4730-01-244-4664	72661	RST20	. FITTING,HOSE	3
* 3	PAFZZ	5306-01-584-9493	0KVE6	8896T129	. BOLT,U	2
* 4	PAFZZ	4820-01-665-3778	82666	T-255-FB-P 1-1/2	. BALL VALVE	5
5	PAFZZ	4730-01-506-4403	39428	4568K261	. PIPE NIPPLE	7
* 6	PAFZZ	4710-01-662-4940	55242	1051F-10	. PIPE ASSEMBLY,METAL	1
7	PAFZZ	4710-01-662-4569	55242	1051F-08	. WELDMENT, DISCHARGE SIDE MANIFOLD	1
8	PAFZZ	4730-01-595-4173	79154	L014075PT0	. COUPLING HALF, QUICK DISCONNECT (INCLUDES 2 PIECE CLAMP AND HARDWARE)	1
9	PAFZZ	4730-01-662-7249	55242	1051F-01-20	. NIPPLE, PIPE	1
10	PCFZZ	5330-01-518-2027	79154	G014077LT0	. GASKET	1
* 11	PAFZZ	5306-01-665-3454	05047	AEB02C375B50CH2A31	. BOLT,MACHINE HEXAGON HEAD	1
* 12	PAFZZ	5310-01-665-0457	05047	AEW24X37N000SB8A31	. WASHER, FLAT	4
13	PAFZZ	5340-01-663-0030	55242	1051F-01-12	. DISCHARGE HOSE SUPPORT BRACKET	1
14	PAFZZ	5340-01-663-6303	55242	1051C-01-88	. GRATING CLASP	1
* 15	PAFZZ	5310-01-475-9244	39428	91831A127	. NUT,SELF-LOCKING, HEXAGON	2
* 16	PAFZZ	5310-01-665-0391	05047	AEW24X31N000SB8A31	. WASHER, FLAT	4
* 17	PAFZZ	5310-01-499-3569	2V507	91831A030	. NUT,SELF-LOCKING, HEXAGON	4
18	PAFZZ	4730-01-541-1396	39428	4429K257	. PIPE, TEE	1
* 19	PAFZZ	4730-01-662-5705	55242	ISO-1142	. ELBOW	1
20	PAFZZ	5340-01-663-2663	55242	1051C-01-47	. PIPING STAND GRATE BRACKET	1
* 21	PAFZZ	5306-01-664-9226	05047	AEB02C375B75CH2A31	. BOLT,MACHINE HEXAGON HEAD	1
					END OF FIGURE	

MAINTAINER
BALL VALVE PLACARD

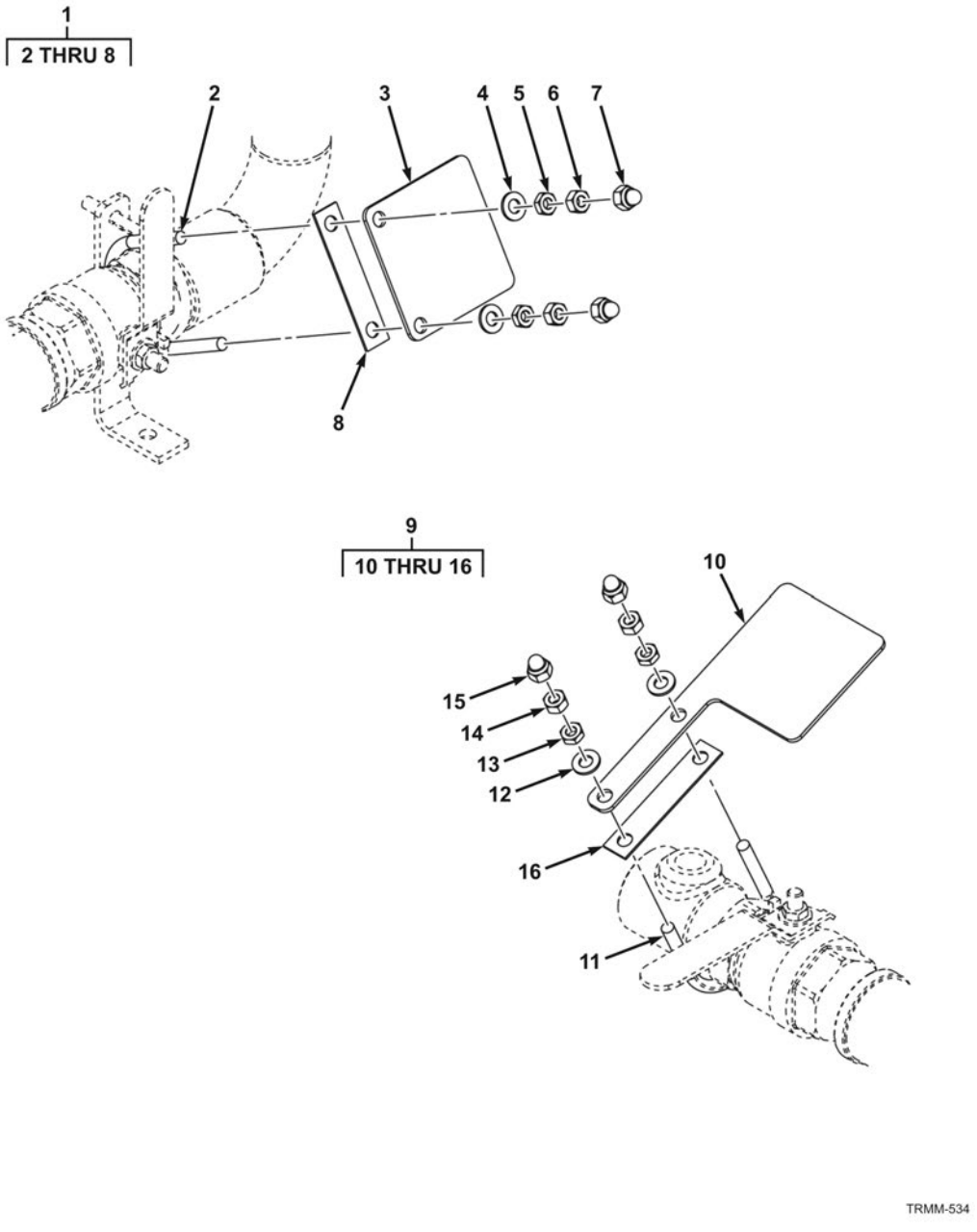


Figure 32. Ball Valve Placard.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 0408 BALL VALVE PLACARD	
					FIG. 32. BALL VALVE PLACARD.	
1	XCFZZ		55242	SKM-331	VALVE LABEL BRACKET, SQUARE.....	1
* 2	PAFZZ	5306-01-584-9493	0KVE6	8896T129	. BOLT,U.....	1
3	PAFZZ	2590-01-663-3040	55242	SKM-331-01	. MARKER, IDENTIFICATION.....	1
* 4	PAFZZ	5310-01-665-0391	05047	AEW24X31N000SB8A31	. WASHER, FLAT.....	2
* 5	PAFZZ	5310-01-665-3128	05047	AEN04C312000SB8A31	. NUT,SELF-LOCKING, HEXAGON.....	2
* 6	PAFZZ	5310-01-499-3569	2V507	91831A030	. NUT,SELF-LOCKING.....	2
* 7	PAFZZ	5310-01-630-4148	39428	91855A540	. NUT,SELF-LOCKING, CAP.....	2
* 8	XDFZZ		39428	8896T163	. HOSE CLAMP BAR (PLACARD SUPPORT).....	1
* 9	XCFZZ		55242	SKM-332	VALVE LABEL BRACKET, OFFSET.....	1
* 10	PAFZZ	2590-01-663-1924	55242	SKM-332-01	. MARKER, IDENTIFICATION.....	1
* 11	PAFZZ	5306-01-584-9493	0KVE6	8896T129	. BOLT,U (INCLUDES U-BOLT AND PLACARD SUPPORT).....	1
* 12	PAFZZ	5310-01-665-0391	05047	AEW24X31N000SB8A31	. WASHER, FLAT.....	2
* 13	PAFZZ	5310-01-665-3128	05047	AEN04C312000SB8A31	. NUT,SELF-LOCKING,.....	2
* 14	PAFZZ	5310-01-499-3569	2V507	91831A030	. NUT,SELF-LOCKING, HEXAGON.....	2
* 15	PAFZZ	5310-01-630-4148	39428	91855A540	. NUT,SELF-LOCKING, CAP.....	2
* 16	XDFZZ		39428	8896T163	. HOSE CLAMP BAR (PLACARD SUPPORT).....	1
					END OF FIGURE	

MAINTAINER
DISCHARGE PORT B CONTROL VALVE (V4)

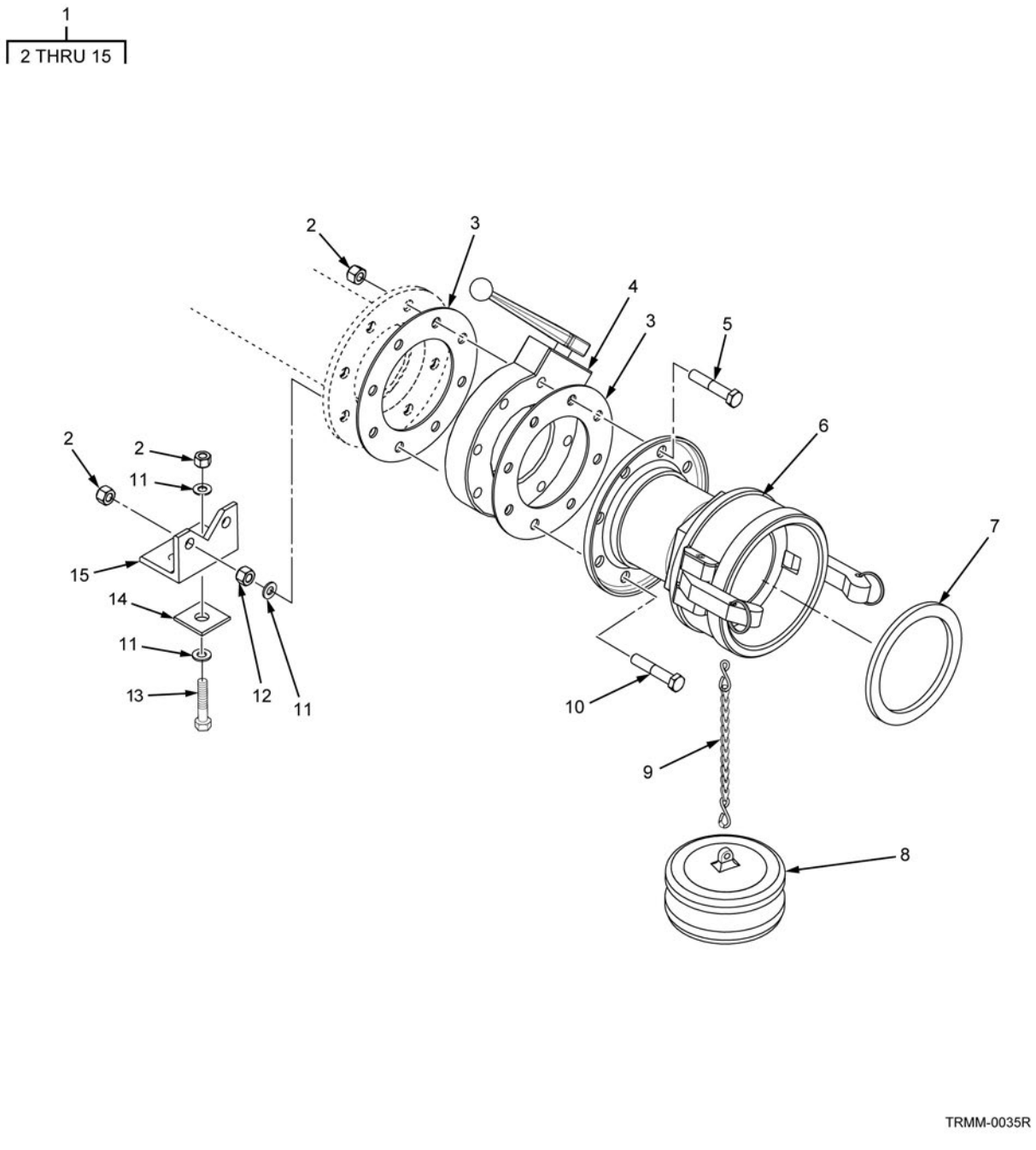


Figure 33. Discharge Port B Control Valve (V4).

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 0409 DISCHARGE PORT B CONTROL VALVE (V4)	
					FIG. 33. DISCHARGE PORT B CONTROL VALVE (V4).	
* 1	PAFFF	4820-01-665-4316	55242	1051F-01-25-01	DISCHARGE PORT B CONTROL VALVE (V4)	1
* 2	PAFZZ	5310-01-475-9244	39428	91831A127	. NUT,SELF-LOCKING,HEXAGON	9
* 3	PCFZZ	5330-01-665-5081	72661	300GTTFCB	. GASKET	2
4	PAFZZ	4820-01-103-7501	13226	WD301ALB	. VALVE,BUTTERFLY	1
* 5	PAFZZ	5306-01-665-0894	05047	AEB02C375B25CH2A31	. BOLT,MACHINE	6
6	PAFZZ	4730-01-662-6907	55242	1051F-01-10	. CAMLOCK COUPLING ASSEMBLY	1
7	PCOZZ	5330-00-899-4509	58536	AA59326-G-9	. GASKET,	1
* 8	PAFZZ	5340-01-665-6744	72661	404-DP-AL	. CAP,PROTECTIVE (DUST PLUG)	1
9	PAFZZ	4010-01-663-6041	55242	1051F-18-01	. SASH CHAIN W/ S-HOOKS	1
* 10	PAFZZ	5306-01-664-9226	05047	AEB02C375B75CH2A31	. BOLT,MACHINE HEXAGON HEAD	2
* 11	PAFZZ	5310-01-665-0457	05047	AEW24X37N000SB8A31	. WASHER, FLAT	4
* 12	PAFZZ	5310-01-665-3067	05047	AEN04C375000SB8A31	. NUT, PLAIN, HEXAGON	2
* 13	PAFZZ	5306-01-665-3454	05047	AEB02C375B50CH2A31	. BOLT,MACHINE HEXAGON HEAD	1
14	PAFZZ	5340-01-663-6303	55242	1051C-01-88	. GRATING CLASP	1
15	PAFZZ	5310-01-663-7911	55242	1051F-01-14	. GRATE FLANGE BRACKET	1

END OF FIGURE

MAINTAINER
DISCHARGE PORT G CONTROL VALVE (V3)

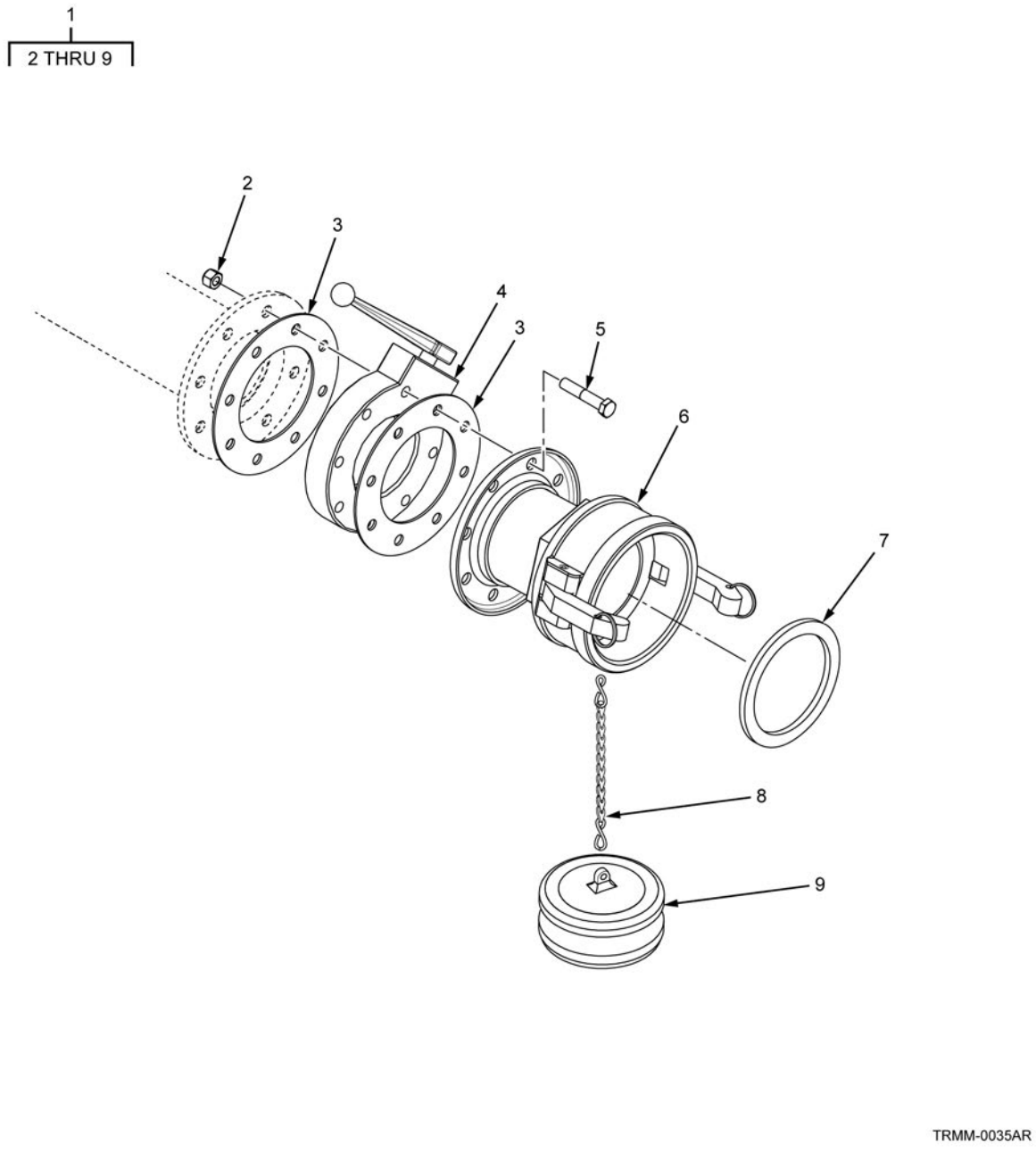


Figure 34. Discharge Port G Control Valve (V3).

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 0410 DISCHARGE PORT G CONTROL VALVE (V3)	
					FIG. 34. DISCHARGE PORT G CONTROL VALVE (V3).	
* 1	PAFFF	4820-01-665-4696	55242	1051F-01-27-01	DISCHARGE PORT G CONTROL VALVE (V3).....	1
* 2	PAFZZ	5310-01-475-9244	39428	91831A127	. NUT,SELF-LOCKING,HEXAGON.....	8
* 3	PCFZZ	5330-01-665-5081	72661	300GTTFCB	. GASKET.....	2
* 4	PAFZZ	4820-01-103-7501	13226	WD301ALB	. VALVE,BUTTERFLY.....	1
* 5	PAFZZ	5306-01-665-0894	05047	AEB02C375B25CH2A31	. BOLT,MACHINE.....	8
6	PAFZZ	4730-01-662-6907	55242	1051F-01-10	. CAMLOCK COUPLING ASSEMBLY.....	1
7	PCOZZ	5330-00-899-4509	58536	AA59326-G-9	. PLUG GASKET.....	1
8	PAFZZ	4010-01-663-6041	55242	1051F-18-01	. SASH CHAIN W/ S-HOOKS.....	1
* 9	PAFZZ	4730-01-665-2006	55242	400-DP-AL	. PLUG,QUICK DISCONNECT.....	1
					END OF FIGURE	

MAINTAINER
DISCHARGE PORT A CONTROL VALVE (V5)

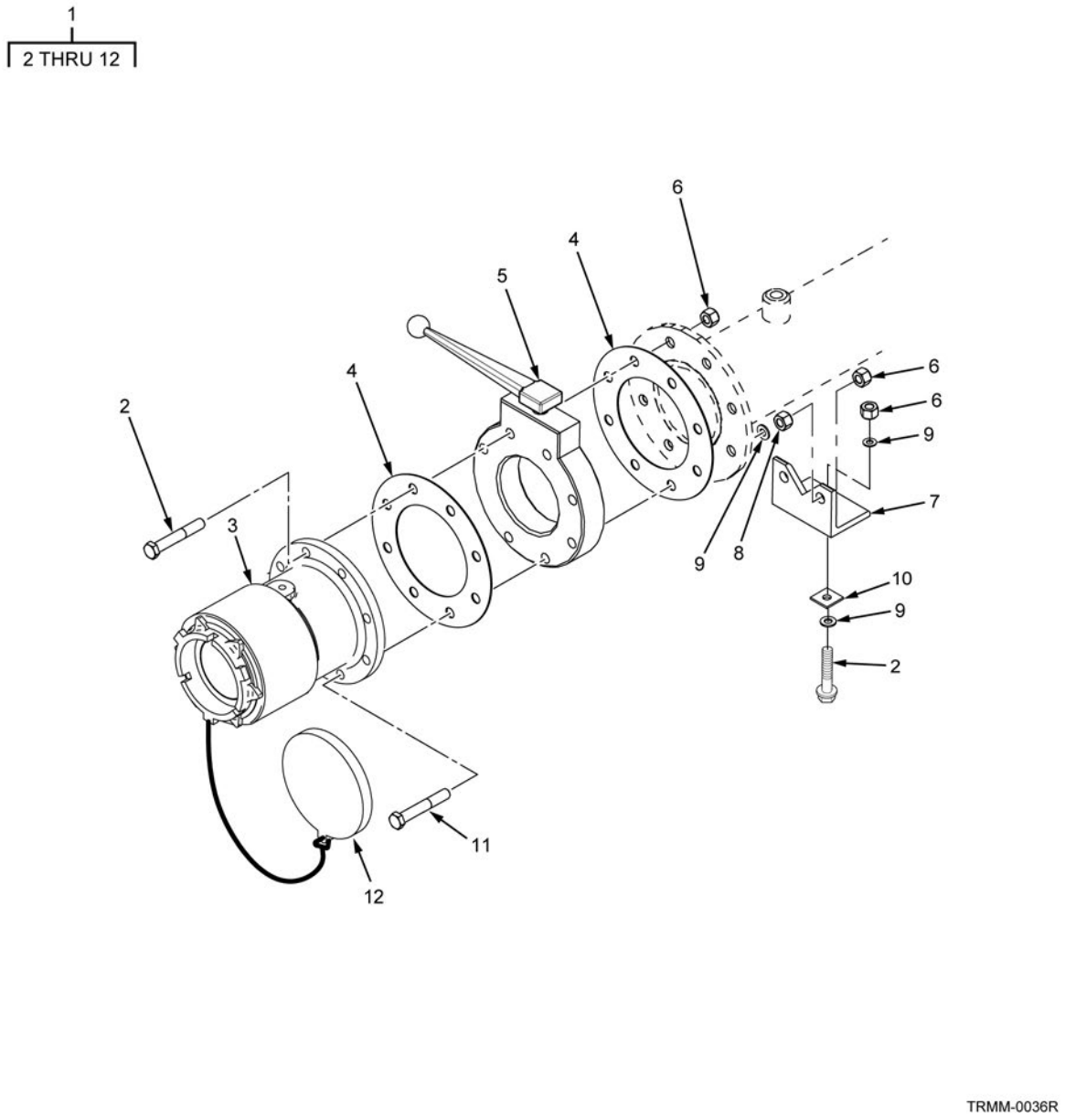


Figure 35. Discharge Port A Control Valve (V5).

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 0411 DISCHARGE PORT A CONTROL VALVE (V5)	
					FIG. 35. DISCHARGE PORT A CONTROL VALVE (V5).	
* 1	PAFFF	4820-01-665-6212	55242	1051F-01-25-02	DISCHARGE PORT A CONTROL VALVE (V5).....	1
* 2	PAFZZ	5306-01-665-3454	05047	AEB02C375B50CH2A31	. BOLT,MACHINE HEXAGON HEAD.....	7
3	PAFZZ	5935-01-535-7147	0DT23	61528BC	. ADAPTER, CONNECTOR.....	1
* 4	PCFZZ	5330-01-665-5081	72661	300GTTFCB	. GASKET.....	2
* 5	PAFZZ	4820-01-103-7501	13226	WD301ALB	. VALVE, BUTTERFLY.....	1
* 6	PAFZZ	5310-01-475-9244	39428	91831A127	. NUT,SELF-LOCKING, HEXAGON.....	9
7	PAFZZ	5310-01-663-7911	55242	1051F-01-14	. GRATE FLANGE BRACKET.....	1
* 8	PAFZZ	5310-01-665-3067	05047	AEN04C375000SB8A31	. NUT, PLAIN, HEXAGON.....	2
* 9	PAFZZ	5310-01-665-0457	05047	AEW24X37N000SB8A31	. WASHER, FLAT.....	4
10	PAFZZ	5340-01-663-6303	55242	1051C-01-88	. GRATING CLASP.....	1
* 11	PAFZZ	5306-01-665-0702	05047	AEB02C375C00CH2A31	. BOLT,MACHINE HEXAGON HEAD.....	2
12	PAFZZ	2590-00-559-1588	0DT23	41607	. CAP, PLASTIC, OPTION B.....	1
					END OF FIGURE	

MAINTAINER
DISCHARGE PORT C CONTROL VALVE (V6)

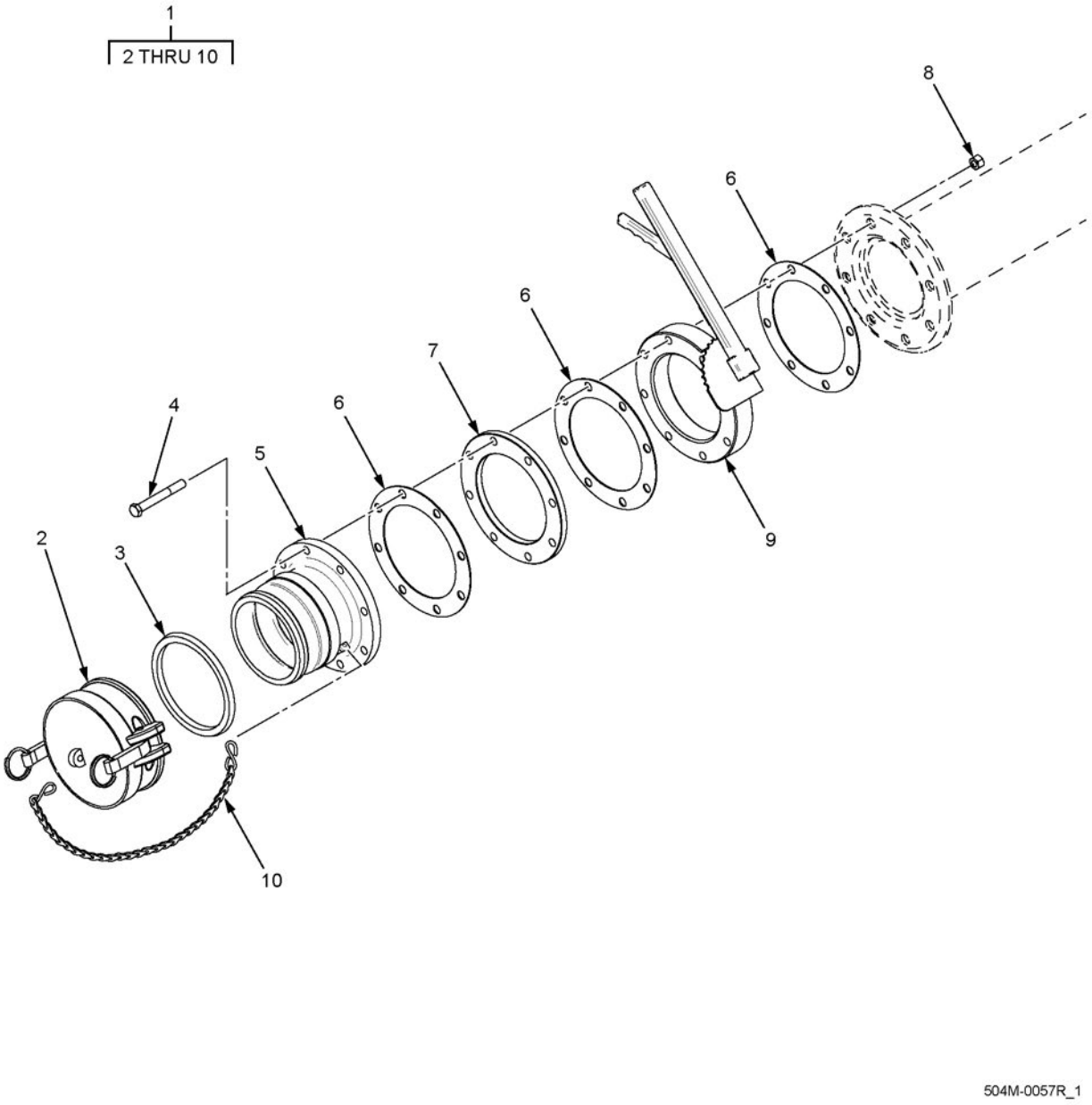


Figure 36. Discharge Port C Control Valve (V6).

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 0412 DISCHARGE PORT C CONTROL VALVE (V6)	
					FIG. 36. DISCHARGE PORT C CONTROL VALVE (V6).	
* 1	PAFFF	4820-01-665-6217	55242	1051F-01-26-01	DISCHARGE PORT C CONTROL VALVE (V6)	1
* 2	PAFZZ	5340-01-666-0925	72661	400-DC-AL	. CAP,PROTECTIVE,DUST AND MOISTURE SEAL	1
3	PCOZZ	5330-00-899-4509	58536	AA59326-G-9	. GASKET,DUST CAP	1
* 4	PAFZZ	5306-01-665-0702	05047	AEB02C375C00CH2A31	. BOLT,MACHINE HEXAGON HEAD	8
5	PAFZZ	4730-01-662-5846	4UE86	633LAT-AL40	. CAMLOCK ADAPTER	1
6	PCFZZ	5330-01-577-5200	72661	400-G-BU	. GASKET	3
* 7	PAFZZ	4730-01-584-1662	3HMC9	20189D	. FLANGE, ALUMINUM	1
* 8	PAFZZ	5310-01-475-9244	39428	91831A127	. NUT,SELF-LOCKING, HEXAGON	8
9	PAFZZ	4810-01-662-0222	13226	WD404ALB	. VALVE,BUTTERFLY	1
10	PAFZZ	4010-01-663-6041	55242	1051F-18-01	. SASH CHAIN W/ S-HOOKS	1
					END OF FIGURE	

MAINTAINER
VALVED DRYBREAK PORT D\E CONTROL VALVES (V7\V8)

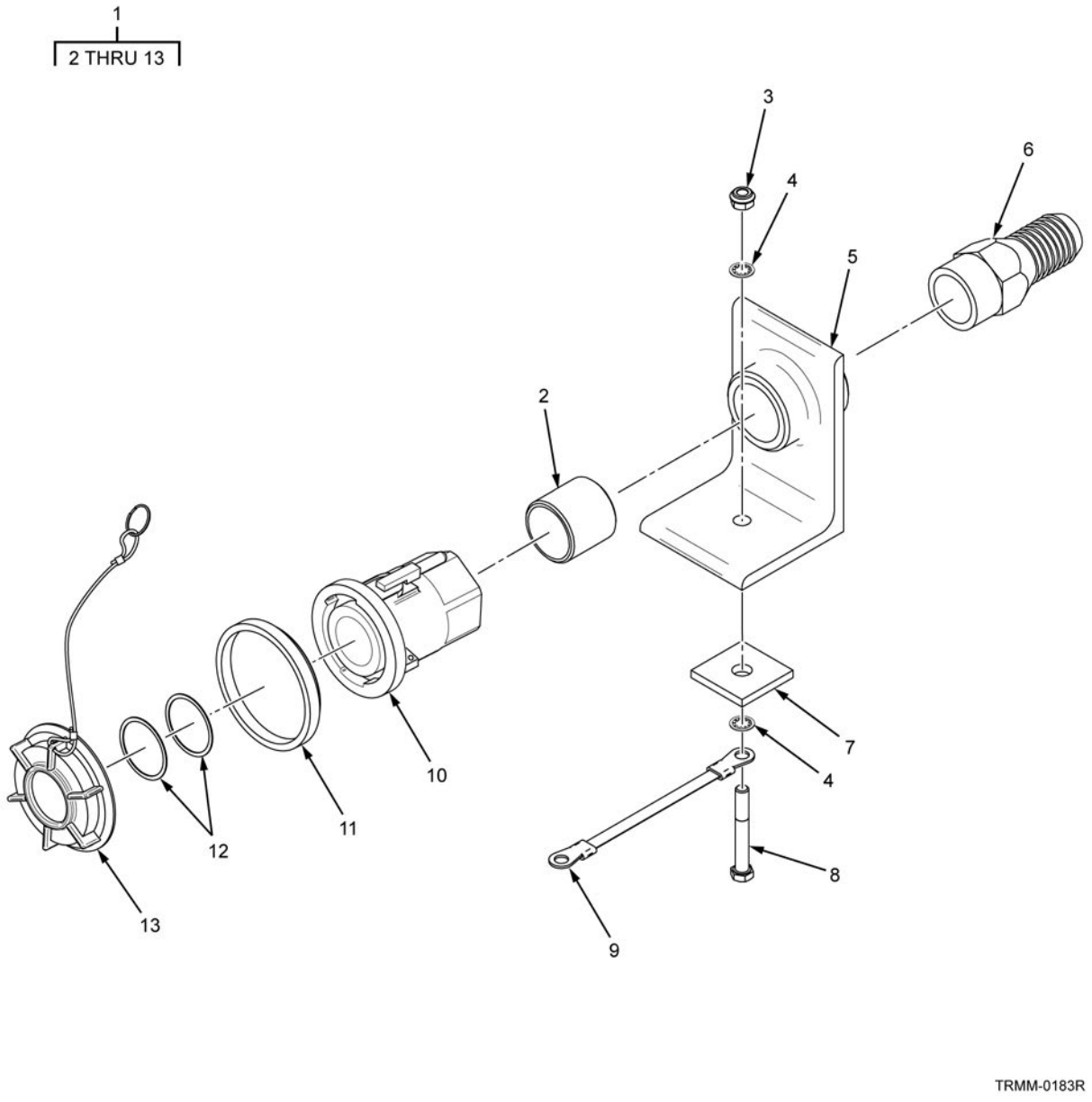


Figure 37. Valved Drybreak Port D\E Control Valves (V7\V8).

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 0413 VALVED DRYBREAK PORT D\E CONTROL VALVES (V7\V8)	
					FIG. 37. VALVED DRYBREAK PORT D \E CONTROL VALVES (V7\V8).	
* 1	PAFFF	4320-01-665-3783	55242	1051F-30	VALVED DRYBREAK PORT E CONTROL VALVE (V8).....	1
* 1	PAFFF	4320-01-665-3789	55242	1051F-29	VALVED DRYBREAK PORT D CONTROL VALVE (V7).....	1
2	PAFZZ	4730-01-506-4403	39428	4568K261	. NIPPLE, PIPE.....	1
* 3	PAFZZ	5310-01-475-9244	39428	91831A127	. NUT,SELF-LOCKING,HEXAGON.....	1
* 4	PAFZZ	5310-01-665-0650	05047	AEW11X375000SB8 A31	. WASHER,LOCK,.....	2
5	PAFZZ	5340-01-663-6324	55242	1051F-01-09	. BRACKET,DRY BREAK MOUNT.....	1
* 6	PAFZZ	4730-01-244-4664	72661	RST20	. FITTING,HOSE.....	1
7	PAFZZ	5340-01-663-6303	55242	1051C-01-88	. CLASP, GRATING.....	1
* 8	PAFZZ	5306-01-664-9226	05047	AEB02C375B75CH2 A31	. BOLT,MACHINE HEXAGON HEAD.....	1
9	PAFZZ	5999-01-662-2476	55242	1051G-09	. STRAP,GROUND (PORT E).....	1
9	PAFZZ	5999-01-662-2804	55242	1051G-10	. STRAP,GROUND (PORT D).....	1
* 10	PAFZZ	4730-01-662-5663	1WG21	USC10012	. COUPLING HALF,QUICK DISCONNECT.....	1
11	PCFZZ	2510-01-641-3811	1WG21	RJ0001	. . CAP, BUMPER.....	1
12	PCFZZ	5330-01-641-3634	1WG21	RJ0009	. . SEAL, PLAIN.....	2
* 13	PAFZZ	5340-01-665-1804	1WG21	RJA1154	. . CAP,PROTECTIVE (DUST PLUG).....	1
					END OF FIGURE	

MAINTAINER
RIGHT SIDE PIPING ASSEMBLY

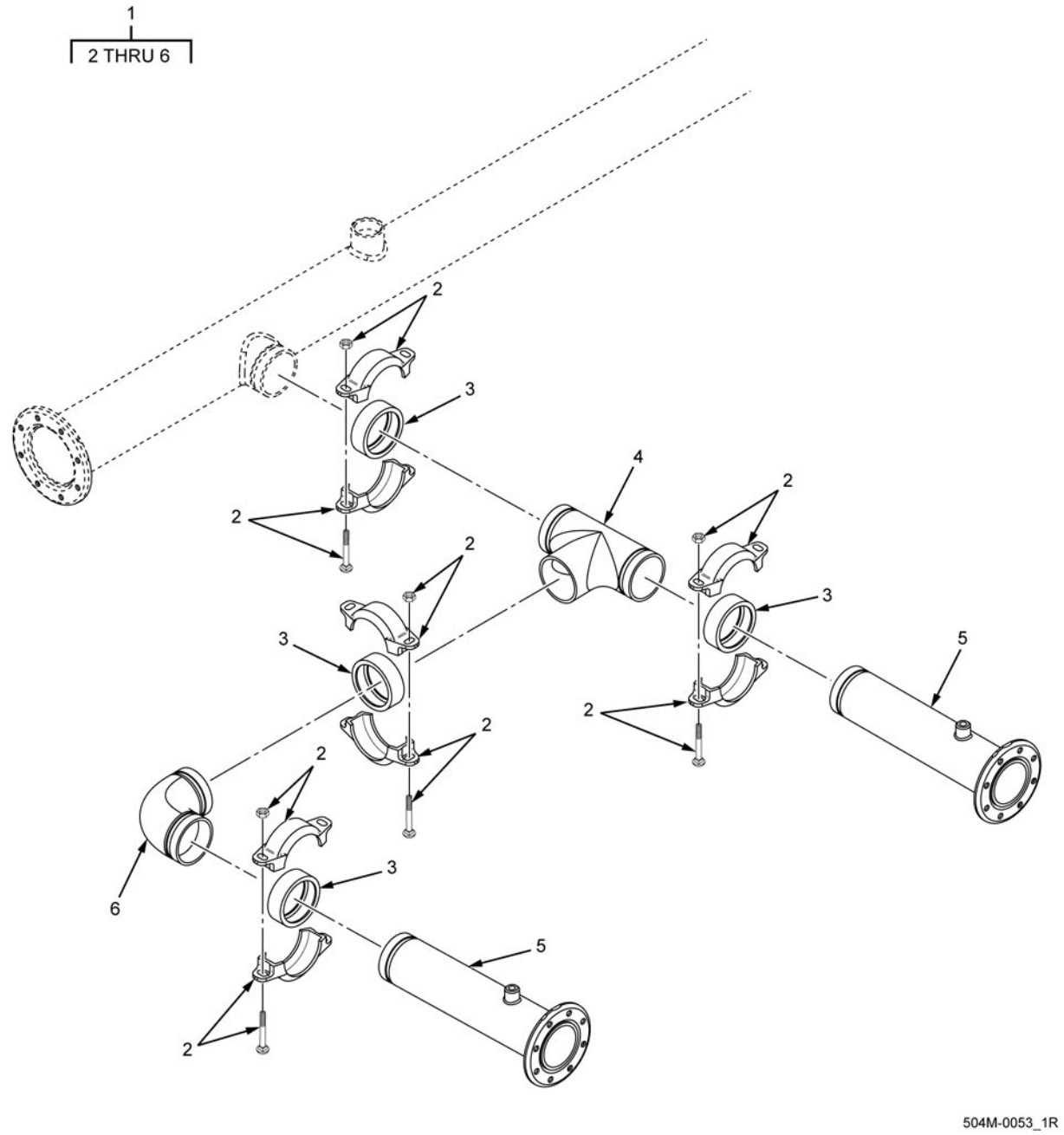


Figure 38. Right Side Piping Assembly.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 0414 RIGHT SIDE PIPING ASSEMBLY	
					FIG. 38. RIGHT SIDE PIPING ASSEMBLY.	
1	XCFFF		55242	1051F-01-25	RIGHT SIDE PIPING ASSEMBLY.....	1
2	PAFZZ	4730-00-855-4919	79154	L030075PT0	. COUPLING, CLAMP, PIPE.....	4
3	PCFZZ	5330-00-391-8491	79154	G030077LT0	. GASKET.....	4
4	PAFZZ	4730-01-662-4549	79154	F030020A00	. TEE.....	1
5	PAFZZ	4710-01-662-4932	55242	1051F-01-05	. PIPE, METALLIC.....	2
6	PAFZZ	4730-00-460-2196	79154	F030010A00	. ELBOW, PIPE.....	1
					END OF FIGURE	

MAINTAINER
BOTTOM PIPING ASSEMBLY, ELBOW

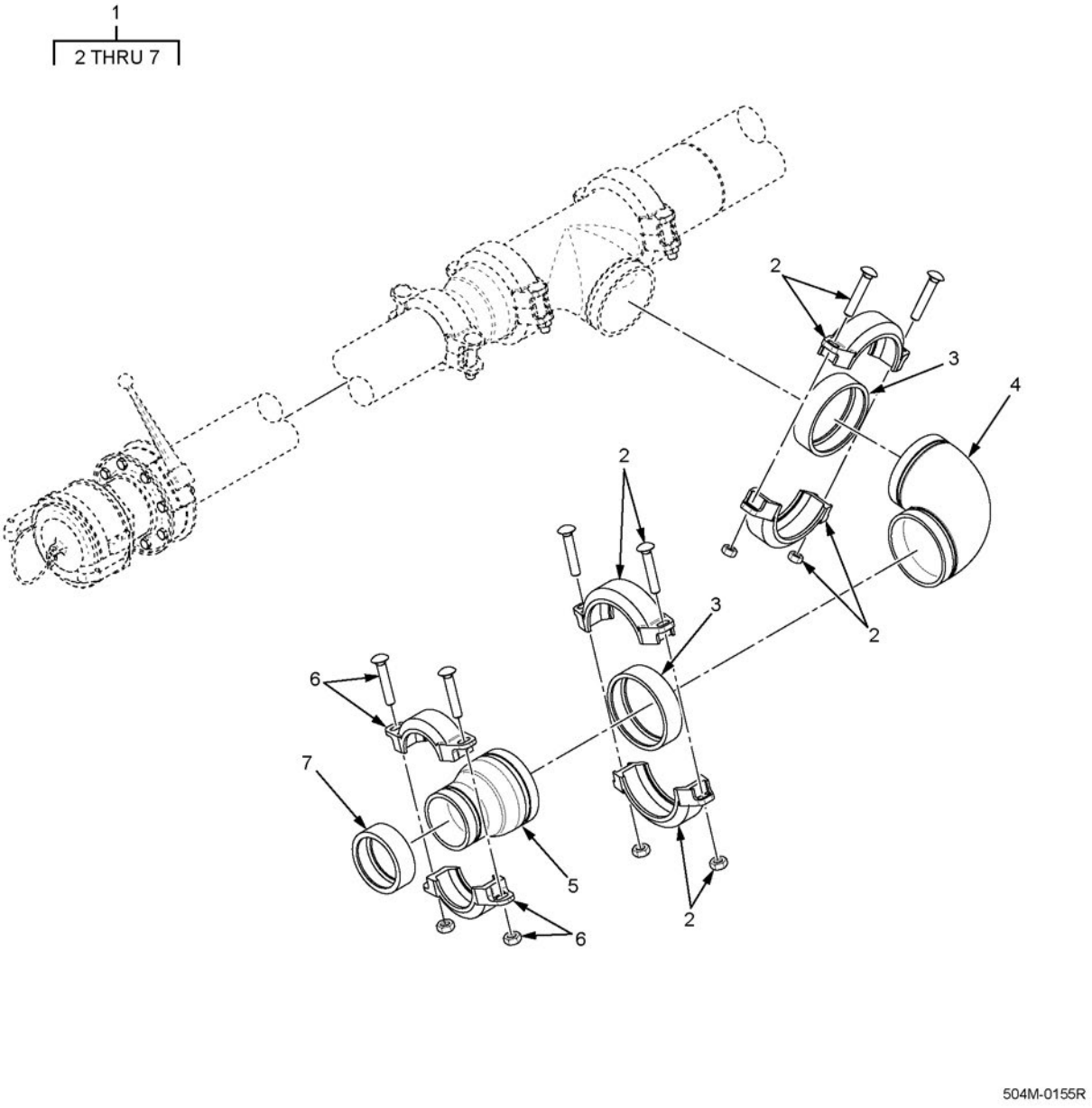


Figure 39. Bottom Piping Assembly, Elbow.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 0415 BOTTOM PIPING ASSEMBLY, ELBOW	
					FIG. 39. BOTTOM PIPING ASSEMBLY, ELBOW.	
1	XCFZZ		55242	1051F-01-29	BOTTOM PIPING ASSEMBLY, ELBOW.....	1
2	PAFZZ	4730-00-855-4916	79154	L040075PT0	. COUPLING, CLAMP, PIPE (INCLUDES COUPLING HALVES, BOLTS, AND NUTS).....	2
3	PCFZZ	5330-01-167-2428	79154	G040077LT0	. GASKET.....	2
4	PAFZZ	4730-01-114-4547	79154	F040010A00	. ELBOW, PIPE.....	1
5	PAFZZ	4730-01-662-7586	55242	1051F-01-17	. COUPLING, REDUCER.....	1
6	PAFZZ	4730-00-855-4919	79154	L030075PT0	. COUPLING, CLAMP, PIPE (INCLUDES COUPLING HALVES, BOLTS, AND NUTS).....	1
7	PCFZZ	5330-00-391-8491	79154	G030077LT0	. GASKET.....	1
					END OF FIGURE	

MAINTAINER
BOTTOM PIPING ASSEMBLY, FRONT PIPING

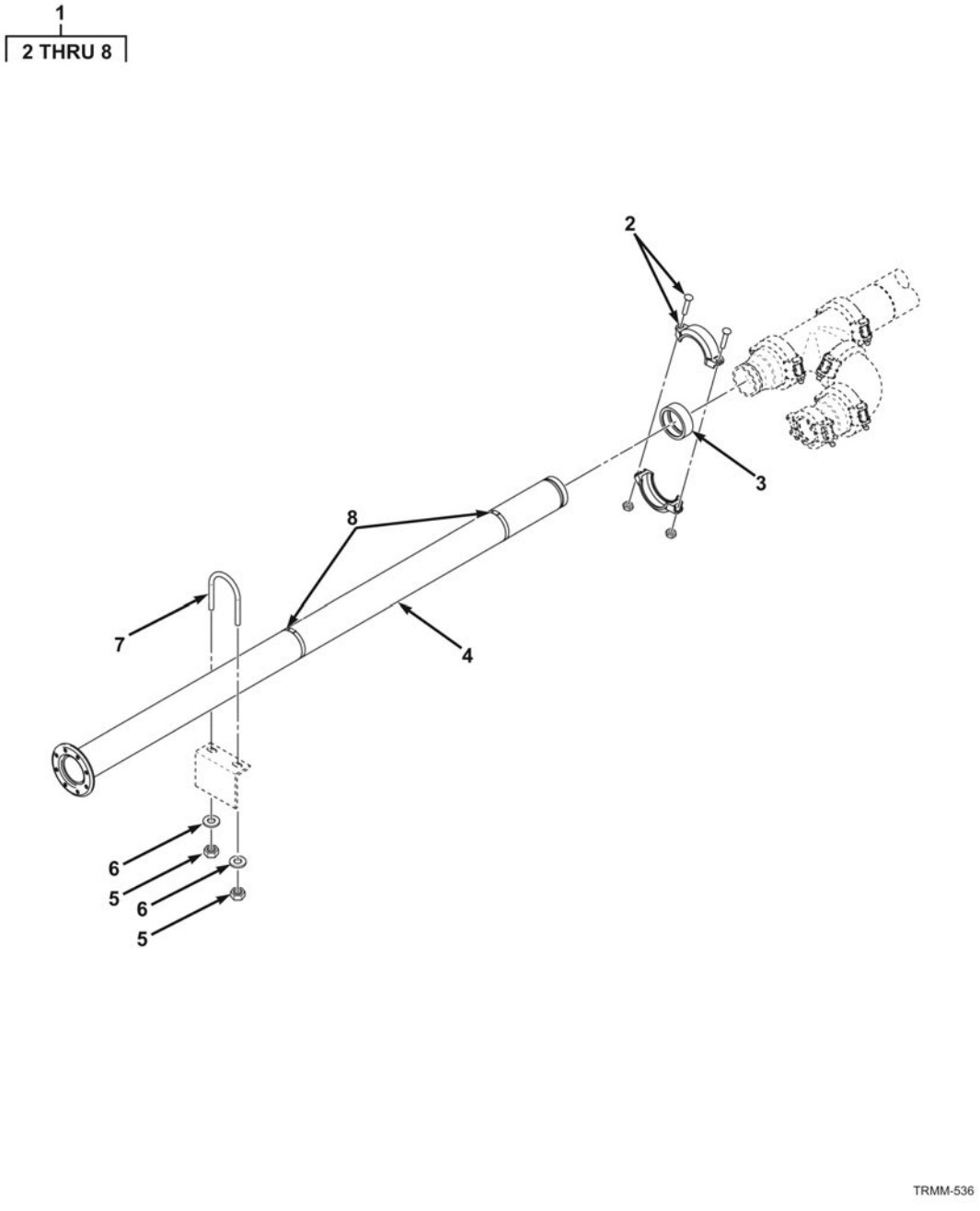


Figure 40. Bottom Piping Assembly, Front Piping.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 0416 BOTTOM PIPING ASSEMBLY, FRONT PIPING	
					FIG. 40. BOTTOM PIPING ASSEMBLY, FRONT PIPING.	
1	XCFZZ		55242	1051F-01-27	BOTTOM PIPING ASSSEMBLY, FRONT PIPING	1
2	PAFZZ	4730-00-855-4919	79154	L030075PT0	. COUPLING,CLAMP, PIPE (INCLUDES COUPLING HALVES, BOLTS, AND NUTS)	1
3	PCFZZ	5330-00-391-8491	79154	G030077LT0	. GASKET	1
4	PAFZZ	4710-01-662-4950	55242	1051F-01-03	. PIPE,METALLIC	1
* 5	PAFZZ	5310-01-475-9244	39428	91831A127	. NUT,SELF-LOCKING,HEXAGON	2
* 6	PAFZZ	5310-01-665-0457	05047	AEW24X37N000SB8A31	. WASHER, FLAT	2
* 7	PAFZZ	5306-01-676-1129	3P6M4	11974-01523	. U-BOLT	1
8	PAFZZ	4730-01-663-6822	55242	ISO-1163	. CLAMP,HOSE	2
					END OF FIGURE	

MAINTAINER
BOTTOM PIPING ASSEMBLY, TEE

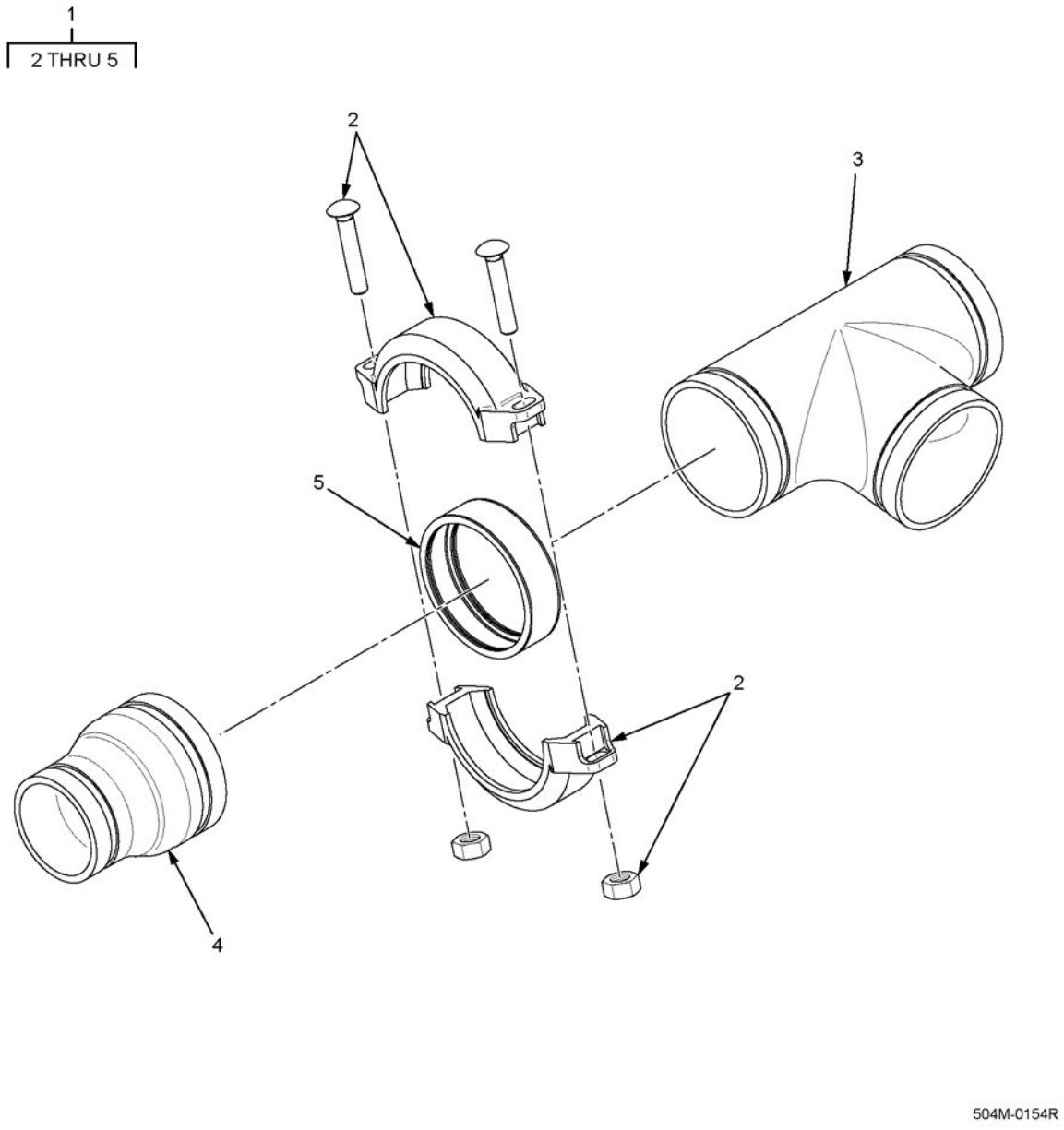


Figure 41. Bottom Piping Assembly, Tee.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 0417 BOTTOM PIPING ASSEMBLY, TEE	
					FIG. 41. BOTTOM PIPING ASSEMBLY, TEE.	
1	XCFZZ		55242	1051F-01-28	BOTTOM PIPING ASSEMBLY, TEE.....	1
2	PAFZZ	4730-00-855-4916	79154	L040075PT0	. COUPLING, CLAMP, PIPE (INCLUDES COUPLING HALVES, BOLTS, AND NUTS).....	1
3	PAFZZ	4730-01-662-4548	79154	F040020A00	. TEE, PIPE, 4 IN.....	1
4	PAFZZ	4730-01-662-7586	55242	1051F-01-17	. COUPLING, REDUCER.....	1
5	PCFZZ	5330-01-167-2428	79154	G040077LT0	. GASKET.....	1
					END OF FIGURE	

MAINTAINER
BOTTOM PIPING ASSEMBLY, REAR PIPING

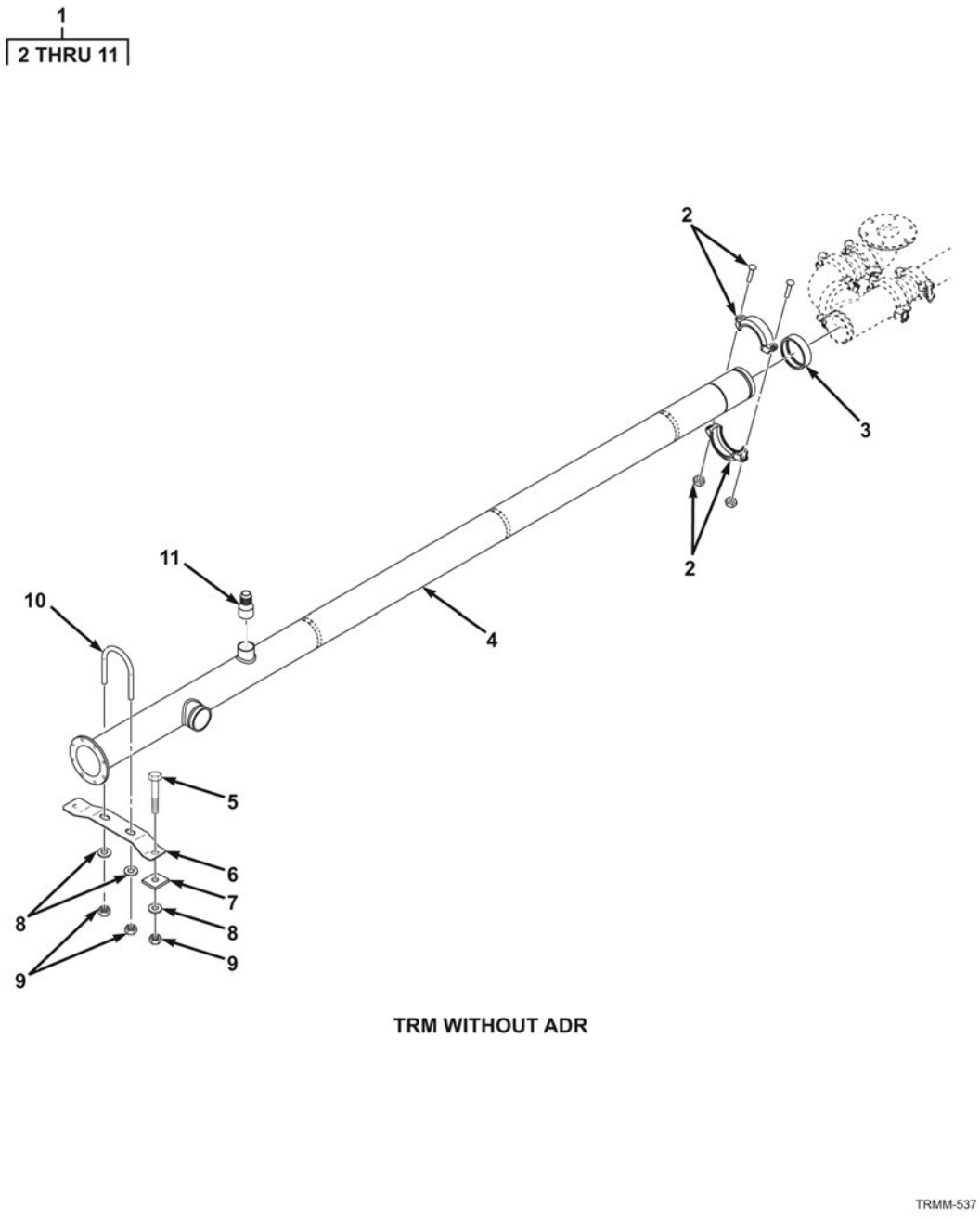


Figure 42. Bottom Piping Assembly, Rear Piping (Sheet 1 of 2).

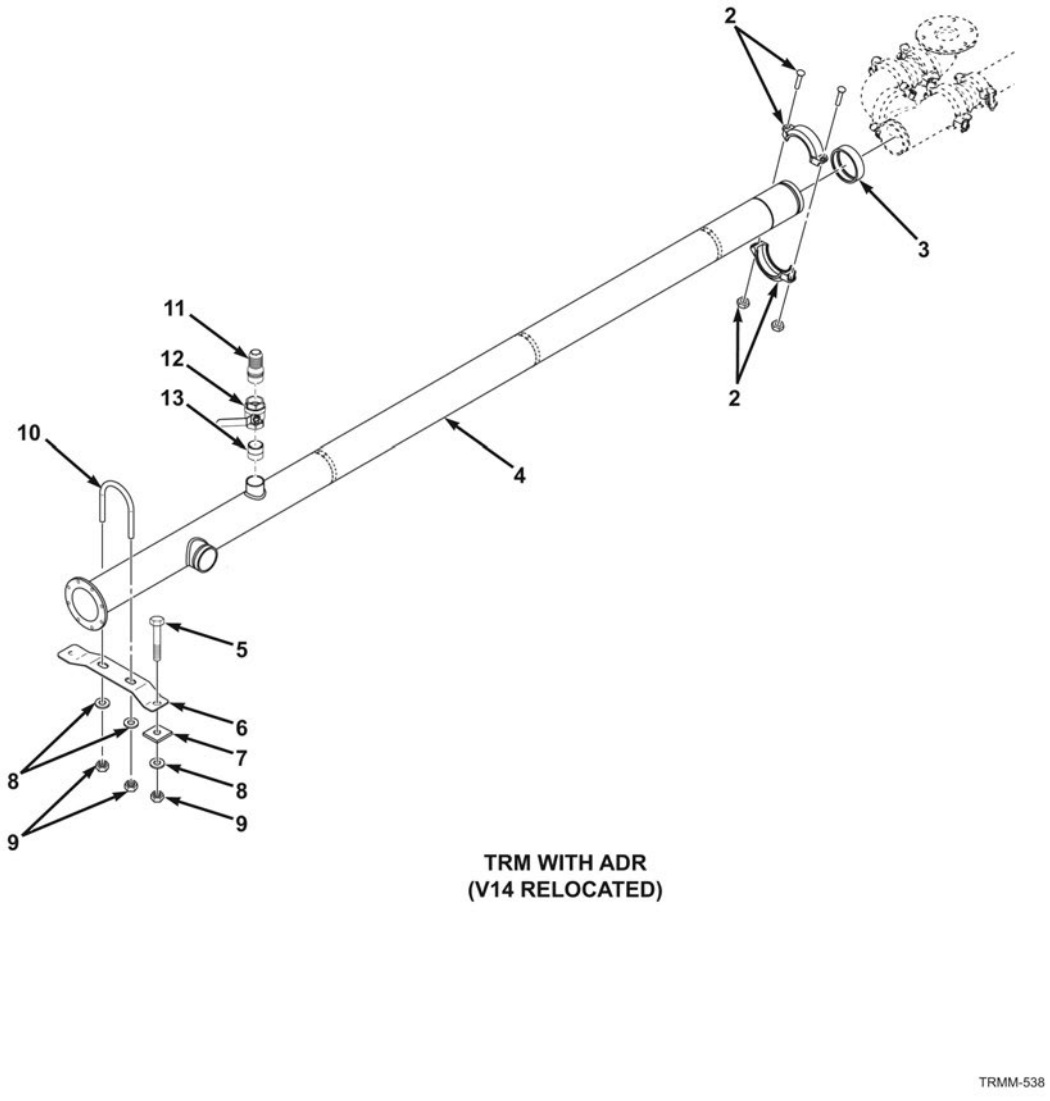


Figure 42. Bottom Piping Assembly, Rear Piping (Sheet 2 of 2).

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 0418 BOTTOM PIPING ASSEMBLY, REAR PIPING	
					FIG. 42. BOTTOM PIPING ASSEMBLY, REAR PIPING.	
1	XCFZZ		55242	1051F-01-26	BOTTOM PIPING ASSEMBLY, REAR PIPING	1
2	PAFZZ	4730-00-855-4916	79154	L040075PT0	. COUPLING, CLAMP, PIPE (INCLUDES COUPLING HALVES, BOLTS, AND NUTS)	1
3	PCFZZ	5330-01-167-2428	79154	G040077LT0	. GASKET	1
4	PAFZZ	4710-01-662-5234	55242	1051F-01-06	. REAR BOTTOM PIPING ASSEMBLY WELDMENT	1
* 5	PAFZZ	5306-01-665-3454	05047	AEB02C375B50CH2A31	. BOLT,MACHINE HEXAGON HEAD	2
6	PAFZZ	5340-01-663-5941	55242	1051F-01-13	. U-BOLT TIE STRAP	1
7	PAFZZ	5340-01-663-6303	55242	1051C-01-88	. GRATING CLASP	2
* 8	PAFZZ	5310-01-665-0457	05047	AEW24X37N000SB8A31	. WASHER, FLAT	4
* 9	PAFZZ	5310-01-475-9244	39428	91831A127	. NUT,SELF-LOCKING, HEXAGON	4
* 10	PAFZZ	5306-01-663-8202	4AJC4	38X4.5X6RDSS	. U-BOLT	1
* 11	PAFZZ	4730-01-244-4664	72661	RST20	. FITTING,HOSE	1
* 12	PAFZZ	4820-01-665-3778	82666	T-255-FB-P 1-1/2	. BALL VALVE (V14, TRM WITH ADR)	1
* 13	PAFZZ	4730-01-506-4403	39428	4568K261	. PIPE NIPPLE (TRM WITH ADR)	1
					END OF FIGURE	

MAINTAINER
STRAINER ASSEMBLY

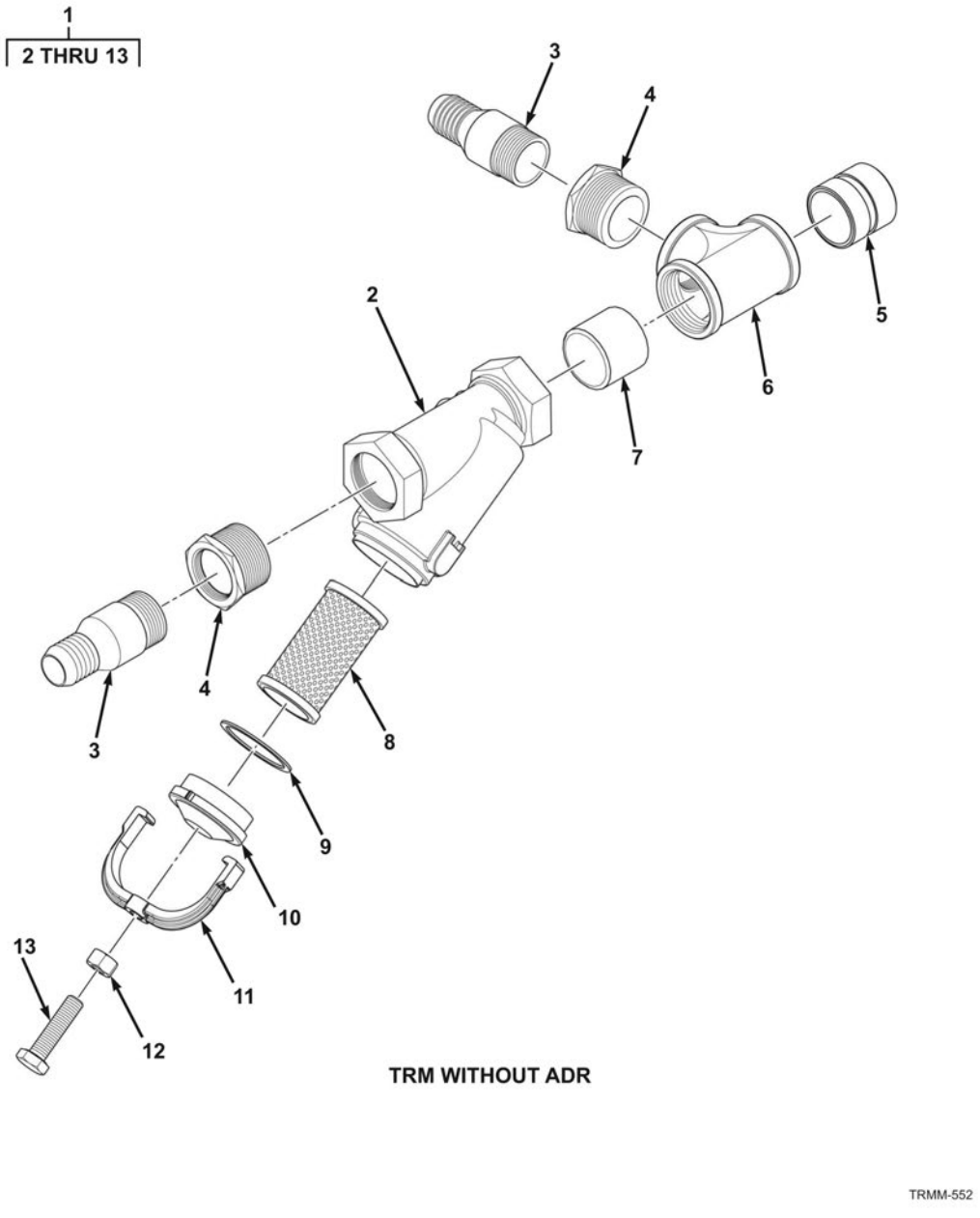


Figure 43. Strainer Assembly (Sheet 1 of 3).

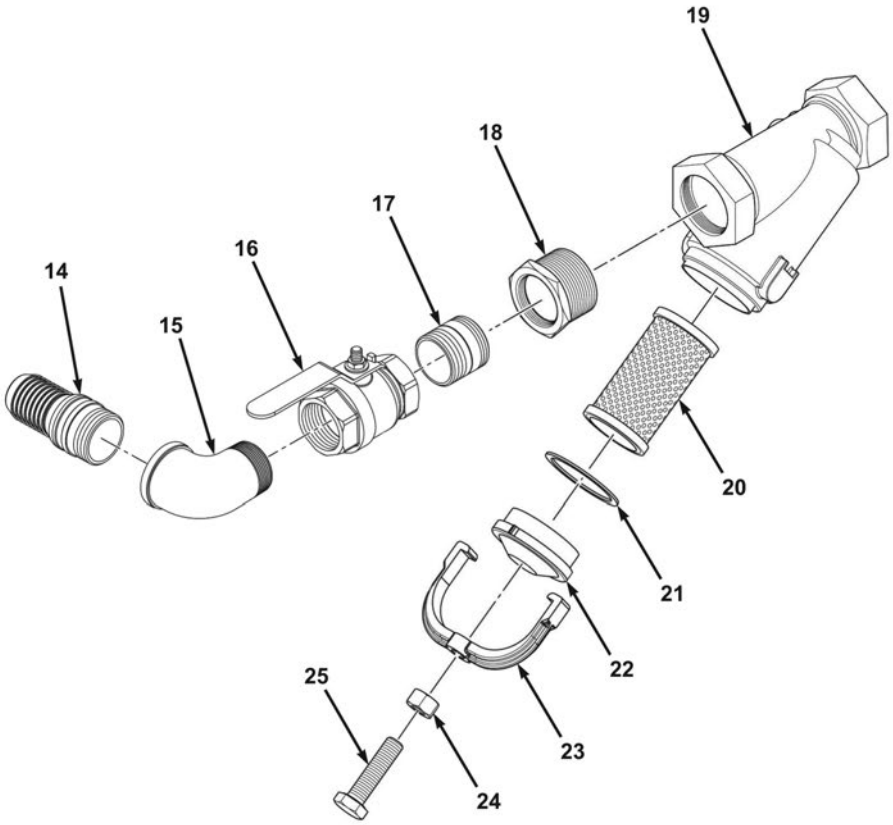


Figure 43. Strainer Assembly (Sheet 2 of 3).

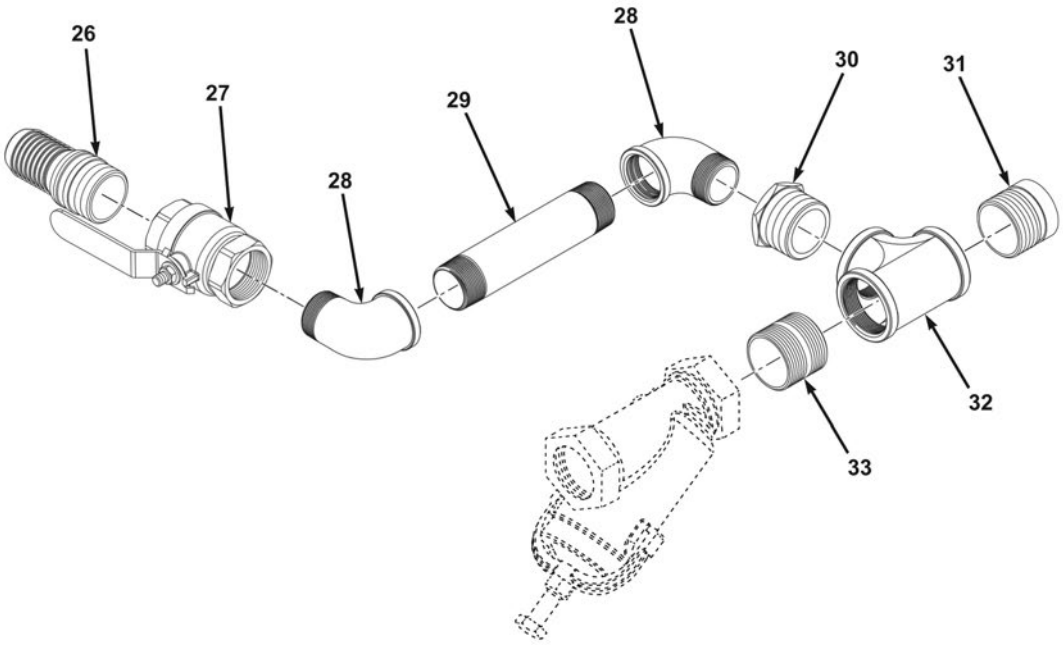


Figure 43. Strainer Assembly (Sheet 3 of 3).

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 0419 STRAINER ASSEMBLY	
					FIG. 43. STRAINER ASSEMBLY.	
1	PAFFF	4730-01-662-7598	55242	1051F-04	STRAINER ASSEMBLY	1
* 2	PAFZZ	4730-01-665-4706	41592	285AL-0201 MB	. STRAINER	1
3	PAFZZ	4730-01-244-4664	72661	RST20	. FITTING,HOSE BARB	2
4	PAFZZ	4730-01-607-6337	39428	4464K175	. BUSHING,PIPE	2
5	PAFZZ	4730-01-662-6888	55242	1051F-01-22	. 2 IN VIC GROOVE TO 2 IN NPT MALE	1
6	PAFZZ	4730-01-540-9708	39428	4429K258	. TEE, PIPE	1
7	PAFZZ	4730-01-481-4245	4X630	863-000396	. NIPPLE,PIPE	1
8	PAFZZ	4730-01-662-4622	41592	285-1406_2S	. STRAINER BASKET	1
9	PCFZZ	5330-01-658-0019	41592	285B--2205 2G	. GASKET	1
* 10	PAFZZ	4330-01-665-2013	41592	285AL-0202 MC	. CAP	1
* 11	PAFZZ	4730-01-665-4845	41592	285---0203 MYP	. YOKE	1
* 12	PAFZZ	5310-01-665-7706	41592	285AL-0108 2N	. NUT,HEXHEAD	1
* 13	PAFZZ	5305-01-665-7710	41592	285AL-0204 2S	. SETSCREW (BOLT)	1
* 14	PAFZZ	4730-01-244-4664	72661	RST20	FITTING,HOSE (ADR - HOSE BARB AT STRAINER INLET)	1
* 15	PAFZZ	4730-01-696-4303	55242	ISO-1535	ELBOW,PIPE (ADR - STREET ELBOW AT STRAINER OUTLET)	1
* 16	PAFZZ	4820-01-665-3778	82666	T-255-FB-P 1-1/2	VALVE,BALL (ADR - BALL VALVE AT STRAINER OUTLET)	1
* 17	PAFZZ	4730-01-506-4403	39428	4568K261	PIPE NIPPLE (ADR - PIPE NIPPLE AT STRAINER OUTLET)	1
* 18	PAFZZ	4730-01-607-6337	39428	4464K175	BUSHING, (ADR - PIPE BUSHING AT STRAINER OUTLET)	1
* 19	PAFZZ	4730-01-665-4706	41592	285AL-0201 MB	STRAINER (ADR - STRAINER / STRAINER OUTLET)	1
* 20	PAFZZ	4730-01-662-4622	41592	285-1406 2S	STRAINER BASKET (ADR - STRAINER BASKET AT STRAINER OUTLET)	1
* 21	PAFZZ	5330-01-658-0019	41592	285B--2205 2G	. GASKET (ADR - STRAINER GASKET AT STRAINER OUTLET)	1
* 22	PAFZZ	4330-01-665-2013	41592	285AL-0202 MC	CAP (ADR - STRAINER CAP AT STRAINER OUTLET)	1
* 23	PAFZZ	4730-01-665-4845	41592	285-0203 MYP	YOKE,STRAINER (ADR - YOKE AT STRAINER OUTLET)	1
* 24	PAFZZ	5310-01-665-7706	41592	285AL-0108 2N	NUT, (ADR - NUT AT STRAINER OUTLET)	1
* 25	PAFZZ	5305-01-665-7710	41592	285AL-0204 2S	SETSCREW (ADR - BOLT AT STRAINER OUTLET)	1

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
* 26	PAFZZ	4730-01-244-4664	72661	RST20	FITTING,HOSE (ADR - HOSE BARB AT STRAINER INLET)	1
* 27	PAFZZ	4820-01-665-3778	82666	T-255-FB-P 1-1/2	VALVE,BALL (ADR- BALL VALVE AT STRAINER INLET)	1
* 28	PAFZZ	4730-01-696-4303	55242	ISO-1535	ELBOW,PIPE (ADR - STREET ELBOW AT STRAINER INLET)	2
* 29	PAFZZ	4730-01-696-4299	55242	ISO-1539	NIPPLE,PIPE (ADR - 1 1/2 IN x 8 IN PIPE NIPPLE AT STRA INER INLET)	1
* 30	PAFZZ	4730-01-607-6337	39428	4464K175	BUSHING, (ADR - PIPE BUSHING AT STRAINER INLET)	1
* 31	PAFZZ	4730-01-662-6888	55242	1051F-01-22	2 IN (ADR - ADAPTER AT STRAINER INLET)	1
* 32	PAFZZ	4730-01-540-9708	39428	4429K258	TEE, PIPE (ADR - STRAINER INLET TEE AT STRAINER INLET)	1
* 33	PAFZZ	4730-01-481-4245	4X630	863-000396	NIPPLE, (ADR - PIPE NIPPLE AT STRAINER INLET)	1

END OF FIGURE

MAINTAINER
FLOW METER ASSEMBLY

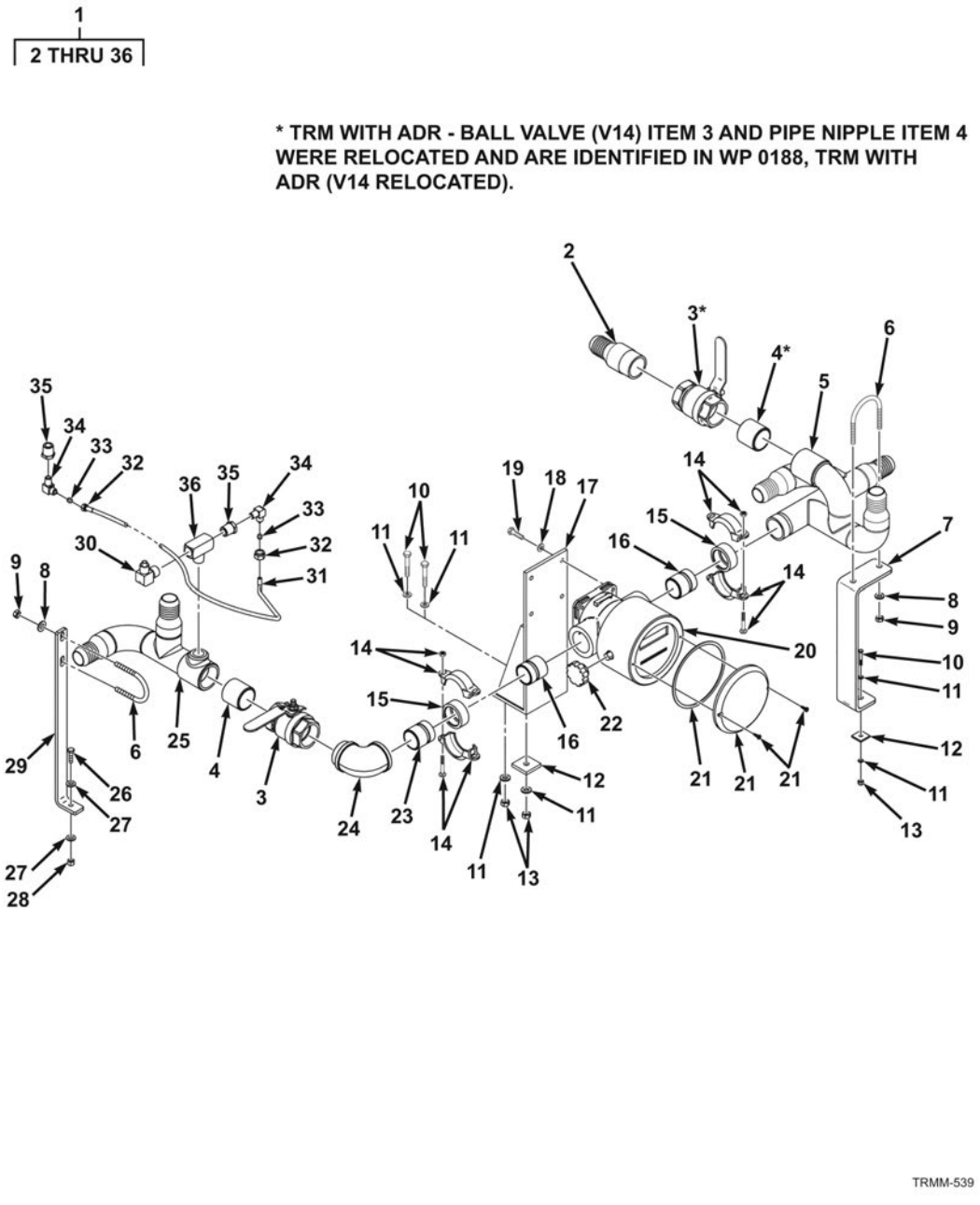

1
2 THRU 36
* TRM WITH ADR - BALL VALVE (V14) ITEM 3 AND PIPE NIPPLE ITEM 4 WERE RELOCATED AND ARE IDENTIFIED IN WP 0188, TRM WITH ADR (V14 RELOCATED).
TRMM-539

Figure 44. Flow Meter Assembly.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 0421 FLOW METER ASSEMBLY	
					FIG. 44. FLOW METER ASSEMBLY.	
1	XCFFF		55242	1051F-05	FLOW METER ASSEMBLY	1
* 2	PAFZZ	4730-01-244-4664	72661	RST20	. FITTING,HOSE	1
* 3	PAFZZ	4820-01-665-3778	82666	T-255-FB-P 1-1/2	. BALL VALVE	2
4	PAFZZ	4730-01-506-4403	39428	4568K261	. NIPPLE, PIPE	2
5	PAFZZ	4710-01-662-4578	55242	1051F-09	. WELDMENT,METER DISCHARGE SIDE (OUTLET PIPING)	1
* 6	PAFZZ	5306-01-584-9493	0KVE6	8896T129	. BOLT,U	2
7	PAFZZ	5340-01-663-0054	55242	1051F-01-11	. BRACKET,MOUNTING	1
* 8	PAFZZ	5310-01-665-0391	05047	AEW24X31N000SB8 A31	. WASHER, FLAT	4
* 9	PAFZZ	5310-01-499-3569	2V507	91831A030	. NUT,SELF-LOCKING,HEXAGON	4
* 10	PAFZZ	5306-01-665-3454	05047	AEB02C375B50CH2 A31	. BOLT,MACHINE HEXAGON HEAD	5
* 11	PAFZZ	5310-01-665-0457	05047	AEW24X37N000SB8 A31	. WASHER, FLAT	10
12	PAFZZ	5340-01-663-6303	55242	1051C-01-88	. GRATING CLASP	3
* 13	PAFZZ	5310-01-475-9244	39428	91831A127	. NUT,SELF-LOCKING,HEXAGON	5
14	PAFZZ	4730-01-595-4173	79154	L014075PT0	. COUPLING HALF, QUICK DISCONNECT (INCLUDES 2 PIECE CLAMP AND HARDWARE)	2
15	PCFZZ	5330-01-518-2027	79154	G014077LT0	. GASKET	4
16	PAFZZ	4730-01-662-4553	55242	1051F-01-19	. COUPLING,VICTAULIC END, MALE NPT, 316 SS	2
17	PAFZZ	5340-01-663-0073	55242	1051F-01-07	. METER MOUNT BRACKET	1
* 18	PAFZZ	5310-01-665-7753	05047	AEW07X375000SB8 A31	. WASHER, LOCK	4
* 19	PAFZZ	5305-01-665-1734	05047	AEB02C375A25CH2 A31	. SCREW,CAP,HEXAGON HEAD	4
20	PAFFF	6680-01-645-5697	61178	TN860AN1CAB2GA C	. METER,FUEL (INCLUDES COVER,GASKET,SCREWS,AND RESET KNOB)	1
21	PAFZZ	5340-01-646-7059	61178	PL5250	. . COVER ASSEMBLY (INCLUDES COVER, GASKET, AND SCREWS)	1
22	PAFZZ	5355-01-645-5913	08915	800G8870	. . KNOB, RESET	1
23	PAFZZ	4730-01-662-7249	55242	1051F-01-20	. NIPPLE,PIPE	1
* 24	PAFZZ	4730-01-667-8850	0U583	24-24 141439FB	. ELBOW,BRASS	1
25	PAFZZ	4710-01-662-4953	55242	1051F-07	. WELDMENT,DISCHARGE TO METER (INLET PIPING)	1

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
* 26	PAFZZ	5306-01-665-3500	05047	AEB02C250A00CH2A31	. BOLT,MACHINE	1
* 27	PAFZZ	5310-01-665-0396	05047	AEW24X25N000SB8A31	. WASHER, FLAT	2
* 28	PAFZZ	5310-01-416-1851	39428	91831A029	. NUT,SELF-LOCKING,HEXAGON	1
29	PAFZZ	5340-01-663-3298	55242	1051C-01-48	. PIPING STAND BRACKET	1
* 30	PAFZZ	4730-01-310-4665	93061	VS269NTA-8-8	. ELBOW,PIPE TO TUBE (BRASS 1/2 IN X 1/2 IN)	1
31	PAFZZ	4710-01-662-6904	55242	1051F-21-03	. TUBE,NONMETALLIC (PRODUCT LINE)	1
* 32	PAFZZ	4730-01-048-6968	0U583	4 100110B	. NUT,TUBE COUPLING	2
33	PAFZZ	4730-01-048-6358	81343	SAE J246 4 100115B	. FERRULE	2
34	PAFZZ	4730-01-086-4064	81343	SAE J246 4-4 100202BA	. STREET ELBOW,BRASS,1/4 IN	2
35	PAFZZ	4730-01-348-6542	93061	209P-8-4	. 1/2 IN MALE NPT x 1/4 IN FEMALE BUSHING, BRASS	2
* 36	PAFZZ	4730-01-517-8518	93061	2224P-8	. BRANCH TEE	1

END OF FIGURE

MAINTAINER
VACUUM BREAKER (VB1)

1
2 THRU 8

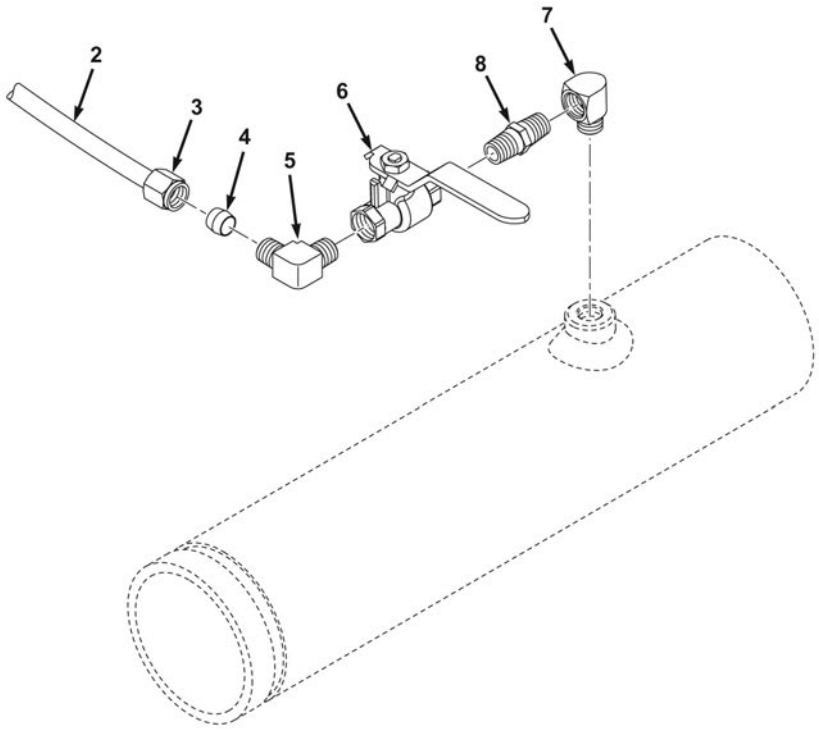


Figure 45. Vacuum Breaker (VB1) (Sheet 1 of 2).

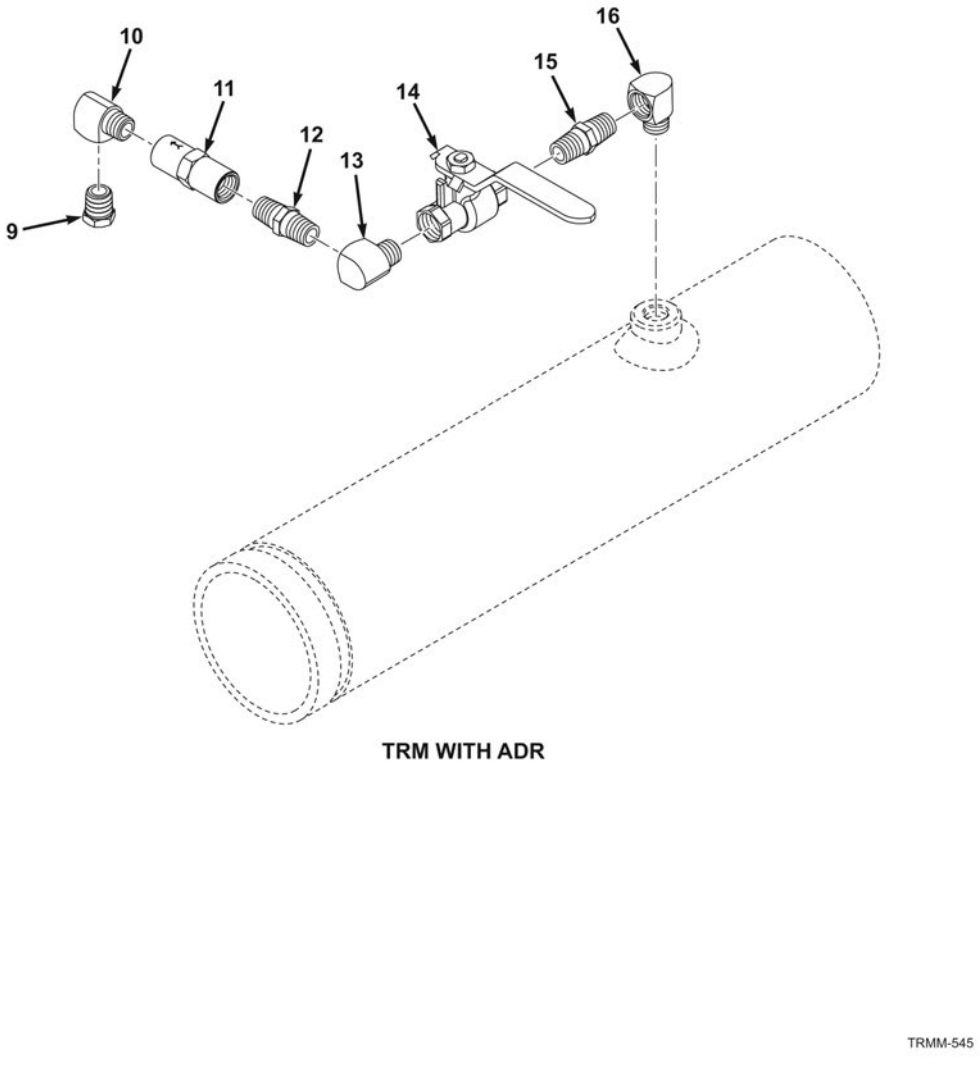


Figure 45. Vacuum Breaker (VB1) (Sheet 2 of 2).

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 0422 VACUUM BREAKER (VB1)	
					FIG. 45. VACUUM BREAKER (VB1).	
1	XCFZZ		55242	1051F-01-23	VACUUM BREAKER (VB1) ASSEMBLY.....	1
2	PAFZZ	4720-01-662-7945	55242	1051F-21-05	. FLEX LINE.....	1
* 3	PAFZZ	4730-01-048-7873	0U583	SAE J246 6 100110B	. TUBE NUT.....	1
4	PAFZZ	4730-01-048-5260	81343	SAE J246 6 100115B	. FERRULE.....	1
5	PAFZZ	4730-00-069-1187	81343	SAE J246 6-4 100202BA	. ELBOW, MALE, BRASS.....	1
* 6	PAFZZ	4820-01-665-4306	82666	T-255-FB-P 1/4	. VALVE, BALL, 1/4.....	1
* 7	PAFZZ	4730-00-278-4824	81343	4-4 140239B	. ELBOW, PIPE.....	1
8	PAFZZ	4730-00-277-8289	93061	216P-4	. NIPPLE MALE.....	1
* 9	PAFZZ	5340-01-529-8907	39428	4456K12	PLUG,VENT (BREATHER VENT).....	1
* 10	PAFZZ	4730-01-453-5124	39428	4429K151	ELBOW,STREET 1/4.....	1
* 11	PAFZZ	4820-01-696-4270	55242	ISO-1533	VALVE,CHECK 1/4.....	1
* 12	PAFZZ	4730-00-277-8289	93061	216P-4	NIPPLE HEX MALE,1/4.....	1
* 13	PAFZZ	4730-01-453-5124	39428	4429K151	ELBOW,STREET 1/4.....	1
* 14	PAFZZ	4820-01-665-4306	82666	T-255-FB-P 1/4	VALVE, BALL, 1/4.....	1
* 15	PAFZZ	4730-00-277-8289	93061	216P-4	NIPPLE 1/4.....	1
* 16	PAFZZ	4730-00-278-4824	81343	4-4 140239B	ELBOW, PIPE.....	1
					END OF FIGURE	

MAINTAINER
POWER CONTROL BOX ASSEMBLY

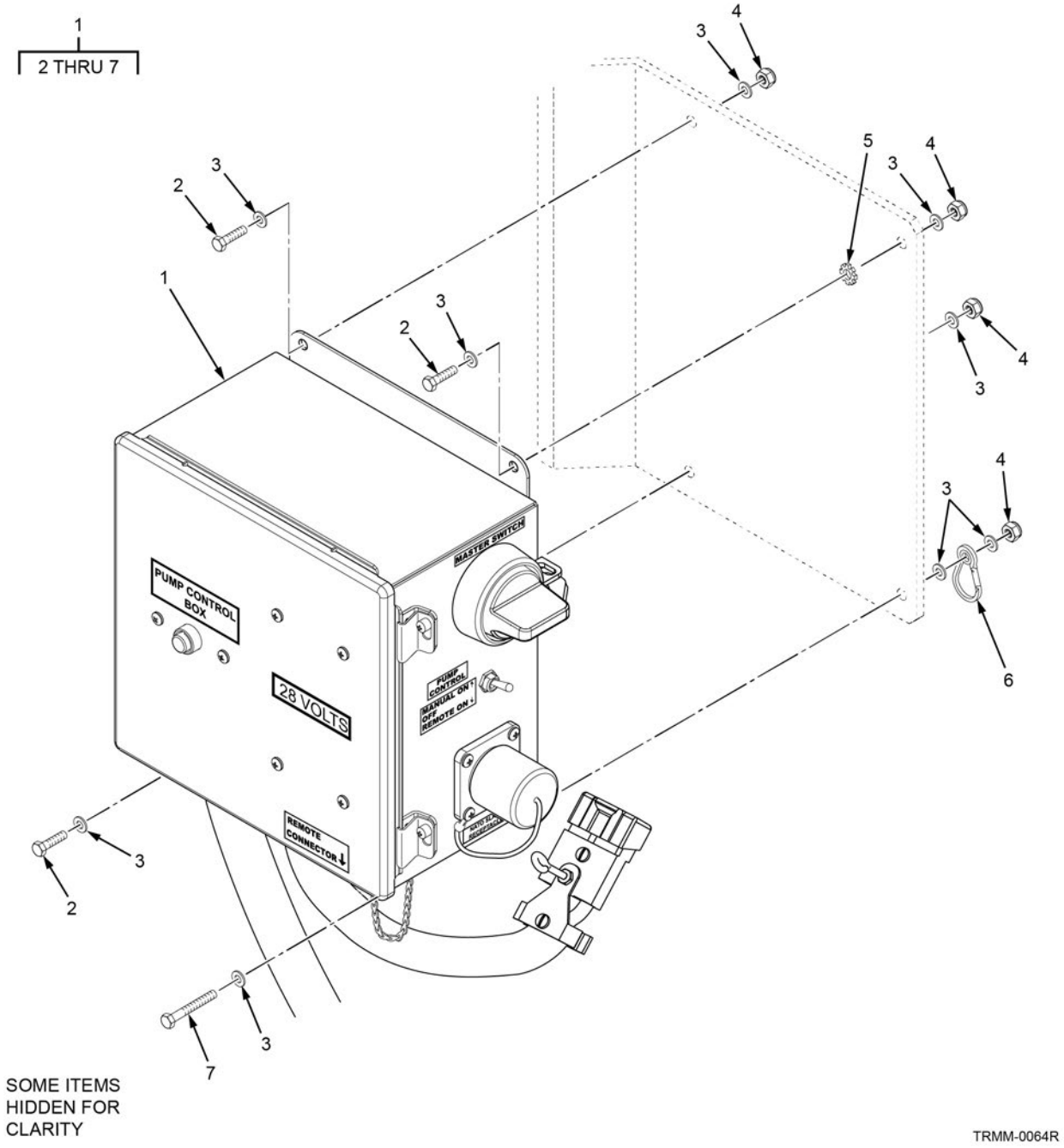


Figure 46. Power Control Box Assembly.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 0500 POWER CONTROL BOX ASSEMBLY	
					FIG. 46. POWER CONTROL BOX ASSEMBLY.	
* 1	PAFFF	6110-01-665-3331	55242	1051G	POWER CONTROL DISTRIBUTION BOX ASSEMBLY	1
* 2	PAFZZ	5306-01-665-3500	05047	AEB02C250A00CH2 A31	. . BOLT,MACHINE	3
* 3	PAFZZ	5310-01-665-0396	05047	AEW24X25N000SB8 A31	. . WASHER, FLAT	9
* 4	PAFZZ	5310-01-416-1851	39428	91831A029	. . NUT,SELF-LOCKING,HEXAGON	4
* 5	PAFZZ	5310-01-665-0650	05047	AEW11X375000SB8 A31	. . WASHER,LOCK,	1
* 6	PAFZZ	5340-01-666-1654	4AJC4	S0121-0060	. . SNAP HOOK (CARABINER)	1
* 7	PAFZZ	5306-01-665-3802	05047	AEB02C250A25CH2 A31	. . BOLT,MACHINE HEXAGON HEAD	1
					END OF FIGURE	

MAINTAINER
POWER CONTROL BOX

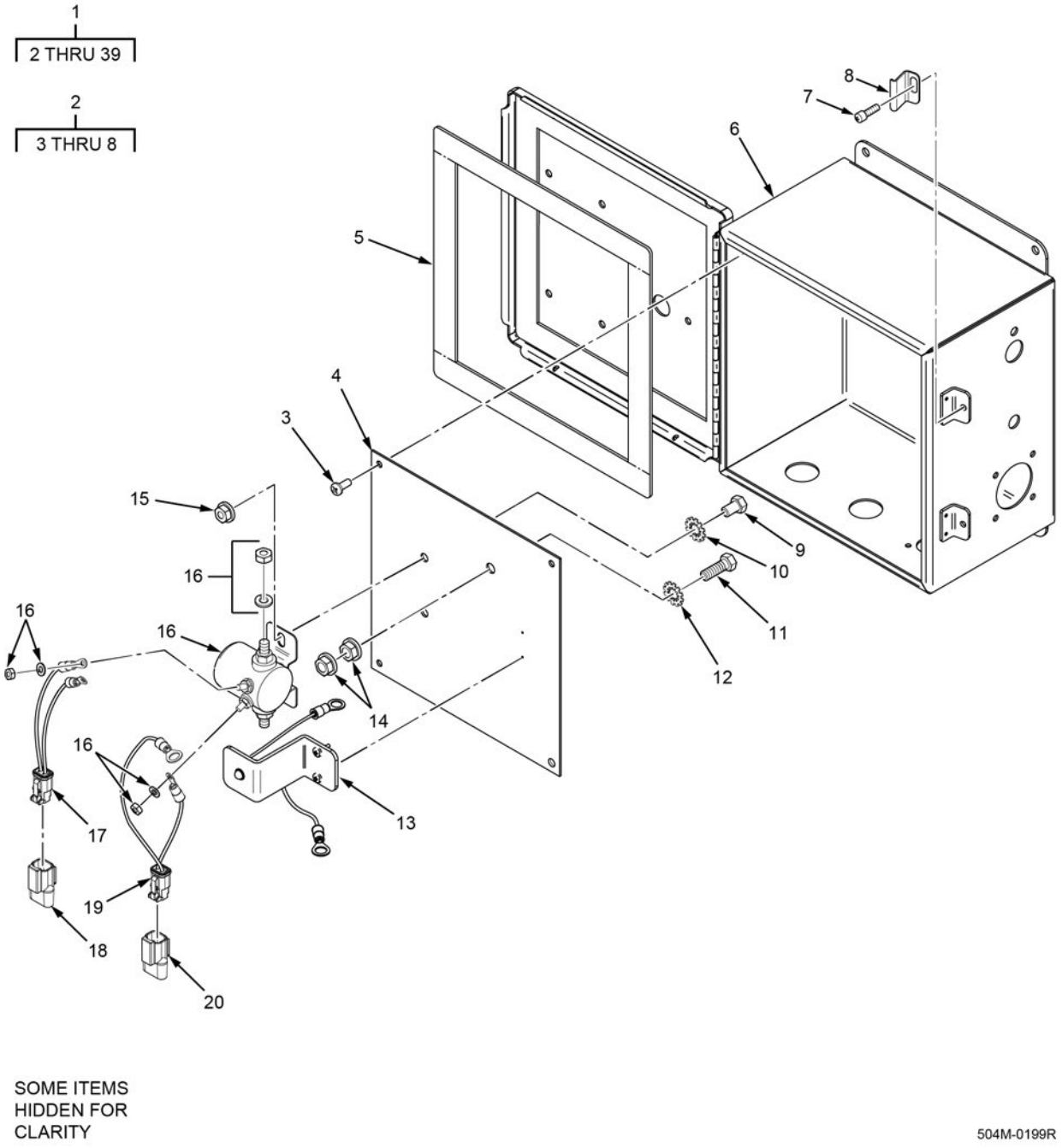


Figure 47. Power Control Box (Sheet 1 of 3).

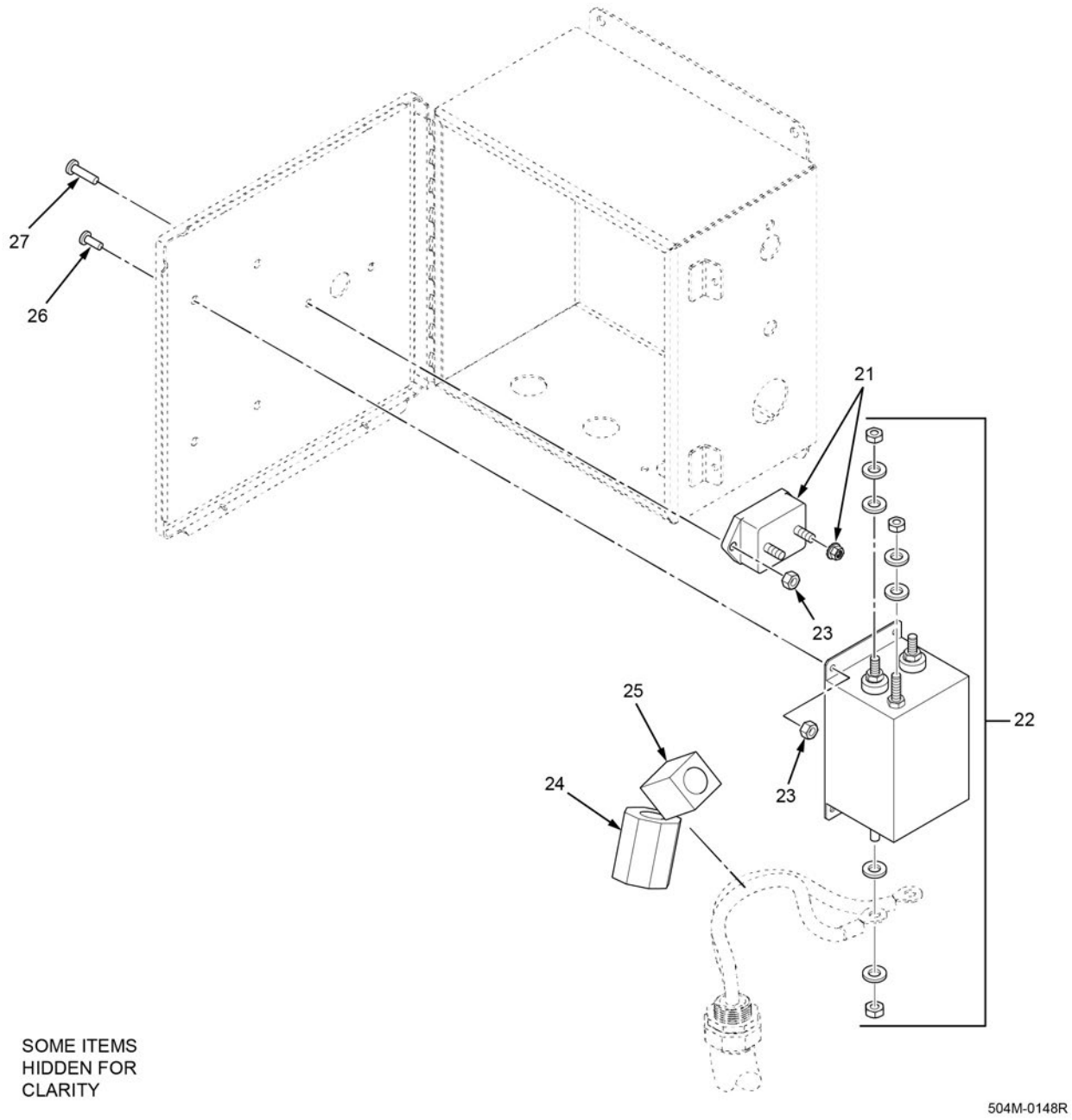


Figure 47. Power Control Box (Sheet 2 of 3).

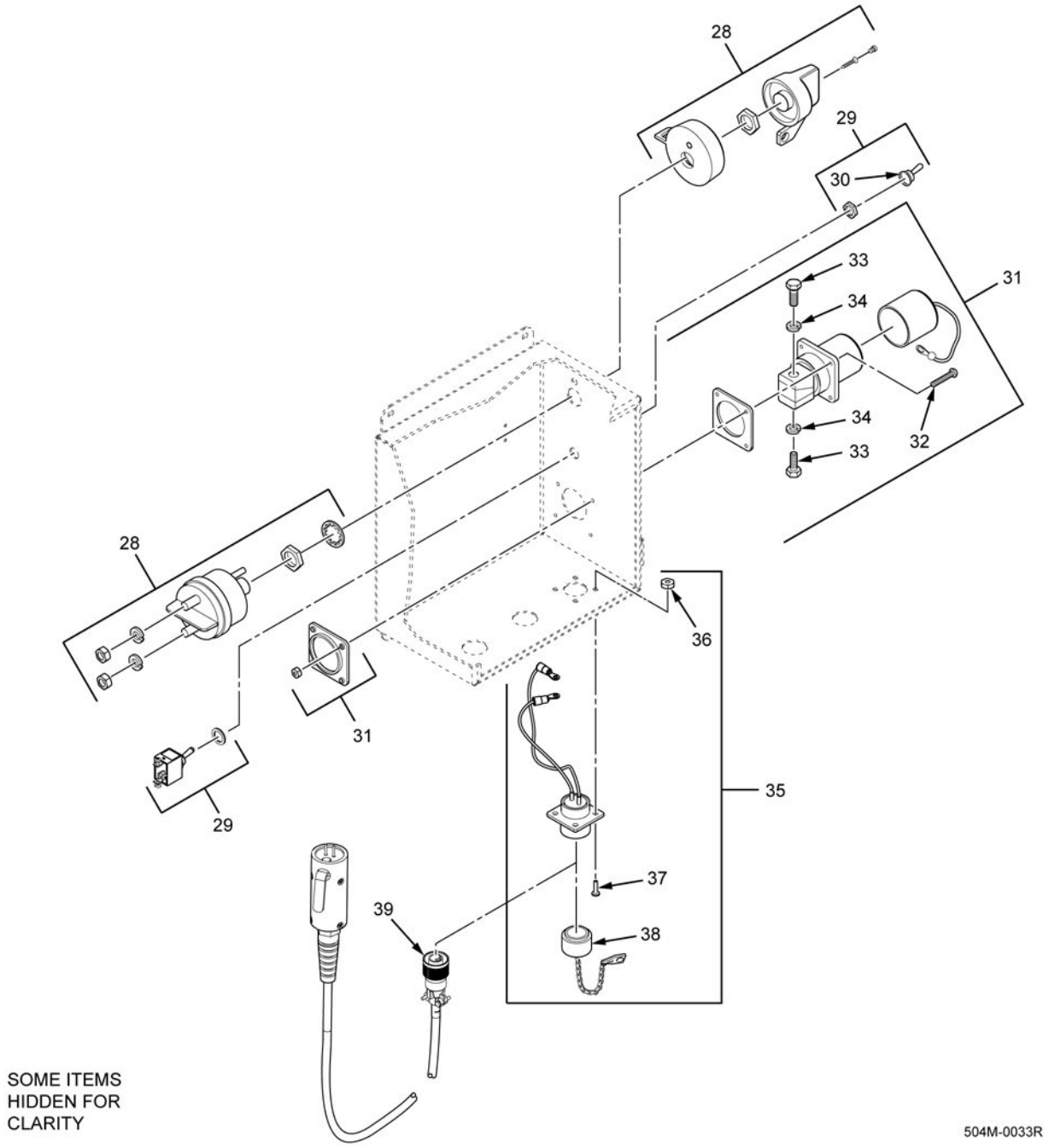


Figure 47. Power Control Box (Sheet 3 of 3).

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 0501 POWER CONTROL BOX	
					FIG. 47. POWER CONTROL BOX.	
* 1	PAFFF	6110-01-665-3331	55242	1051G	POWER CONTROL DISTRIBUTION BOX ASSEMBLY	1
2	PAFZZ	5975-01-662-2582	55242	1051G-01	. CONTROL BOX ENCLOSURE	1
3	PAFZZ	5305-01-663-6836	39428	90279A827	. . SCREW,MACHINE	4
4	PAFZZ	5340-01-663-6527	55242	1051G-01-01	. . REAR PLANE	1
* 5	PCFZZ	5999-01-665-4122	55242	1051G-02-06	. . SHIELDING GASKET,ELECTRONIC	1
6	PAFZZ	5975-01-662-2418	55242	1051G-01-05	. . CONTROL BOX ENCLOSURE, MAIN	1
7	PAFZZ	5305-01-561-5707	39428	91772A245	. . SCREW,MACHINE	2
8	PAFZZ	5340-01-663-6533	55242	1051G-01-06	. . CLAMP ASSEMBLY	2
* 9	PAFZZ	5306-01-666-2968	05047	AEB02C312500SB8 A31	. BOLT, MACHINE	2
* 10	PAFZZ	5310-01-667-4803	05047	AEW15X312880WJ1 AC1	. WASHER, LOCK	2
* 11	PAFZZ	5305-01-532-9137	39428	92865A624	. SCREW,CAP,HEXAGON HEAD	1
* 12	PAFZZ	5310-01-547-2721	39428	95795A030	. WASHER,LOCK,EXTERNAL TOOTH	1
13	PAFZZ	6625-01-662-2799	55242	1051G-13	. LED TEST LIGHT ASSEMBLY	1
* 14	PAFZZ	5310-01-592-2747	39428	94831A030	. NUT,SERRATED FLANGE	2
* 15	PAFZZ	5310-01-466-8127	39428	93776A461	. NUT,SERRATED FLANGE	2
16	PAFZZ	5945-00-081-9491	13445	24063	. RELAY 24 VOLT	1
17	PAFZZ	5980-01-662-2409	55242	1051G-22	. DIODE	1
* 18	PAFZZ	5935-01-507-4497	4AFU8	C-DT04-2P-RT01	. . CONNECTOR,PLUG,ELECTRICAL (DIODE)	1
19	PAFZZ	5995-01-662-6561	55242	1051G-23	. DIODE	1
* 20	PAFZZ	5935-01-507-4497	4AFU8	C-DT04-2P-RT01	. . CONNECTOR,PLUG,ELECTRICAL (DIODE)	1
* 21	PAFZZ	5925-01-665-1512	8H694	19M-P10-B-070-02	. 70 AMP CIRCUIT BREAKER	1
* 22	PAFZZ	5805-01-602-3816	64135	DC60F	. EMI CHANNEL	1
* 23	PAFZZ	5310-01-463-4929	39428	91831A011	. NUT,SELF-LOCKING,HEXAGON	6
24	PAFZZ	2840-01-591-1503	34899	0444176451	. FERRITE CORE	1
25	PAFZZ	5998-01-539-6228	34899	0431173551	. FERRITE CORE	1
* 26	PAFZZ	5305-01-665-7774	05047	AESF5C190500CH2 A31	. SCREW, MACHINE	4
* 27	PAFZZ	5305-01-665-7766	05047	AESF5C190750CH2 A31	. SCREW, MACHINE	2
28	PAFZZ	5930-01-646-6462	13445	75920	. SWITCH, ROTARY (MASTER SWITCH)	1

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
29	PAFZZ	5930-01-662-2307	39428	7343K731	. POWER CONTROL TOGGLE SWITCH.....	1
30	PCFZZ	5930-01-645-2944	39428	70205K4	. . BOOT, DUST AND MOISTURE SEAL.....	1
* 31	PAFZZ	5935-01-097-9974	19207	11674728	. CONNECTOR RECEPTACLE, QUICK DISCONNECT (NATO SLAVE RECEPTACLE).....	1
* 32	PAFZZ	5305-01-665-7344	05047	AESF5C190A00CH2A31	. . BOLT, MACHINE.....	4
* 33	PAFZZ	5305-01-663-7085	39428	92240A351	. . SCREW,CAP, HEXAGON HEAD.....	2
* 34	PAFZZ	5310-01-665-7753	05047	AEW07X375000SB8A31	. . WASHER, LOCK.....	2
35	PAFZZ	5935-01-663-3239	55242	1051G-25	. REMOTE CONNECTOR ASSEMBLY.....	1
* 36	PAFZZ	5310-01-483-2638	39428	91831A007	. . NUT,SELF-LOCKING,HEXAGON.....	4
* 37	PAFZZ	5305-01-666-0895	05047	AESF6C138500SB8A31	. . SCREW, MACHINE.....	4
38	PAFZZ	5340-01-343-4333	43944	CA121003-5	. . CAP,PROTECTIVE, DUST AND MOISTURE.....	1
39	PAFZZ	6110-01-656-1924	55242	1051G-06	. REMOTE CONNECTOR SWITCH ASSEMBLY.....	1

END OF FIGURE

MAINTAINER
POWER CONTROL BOX WIRING

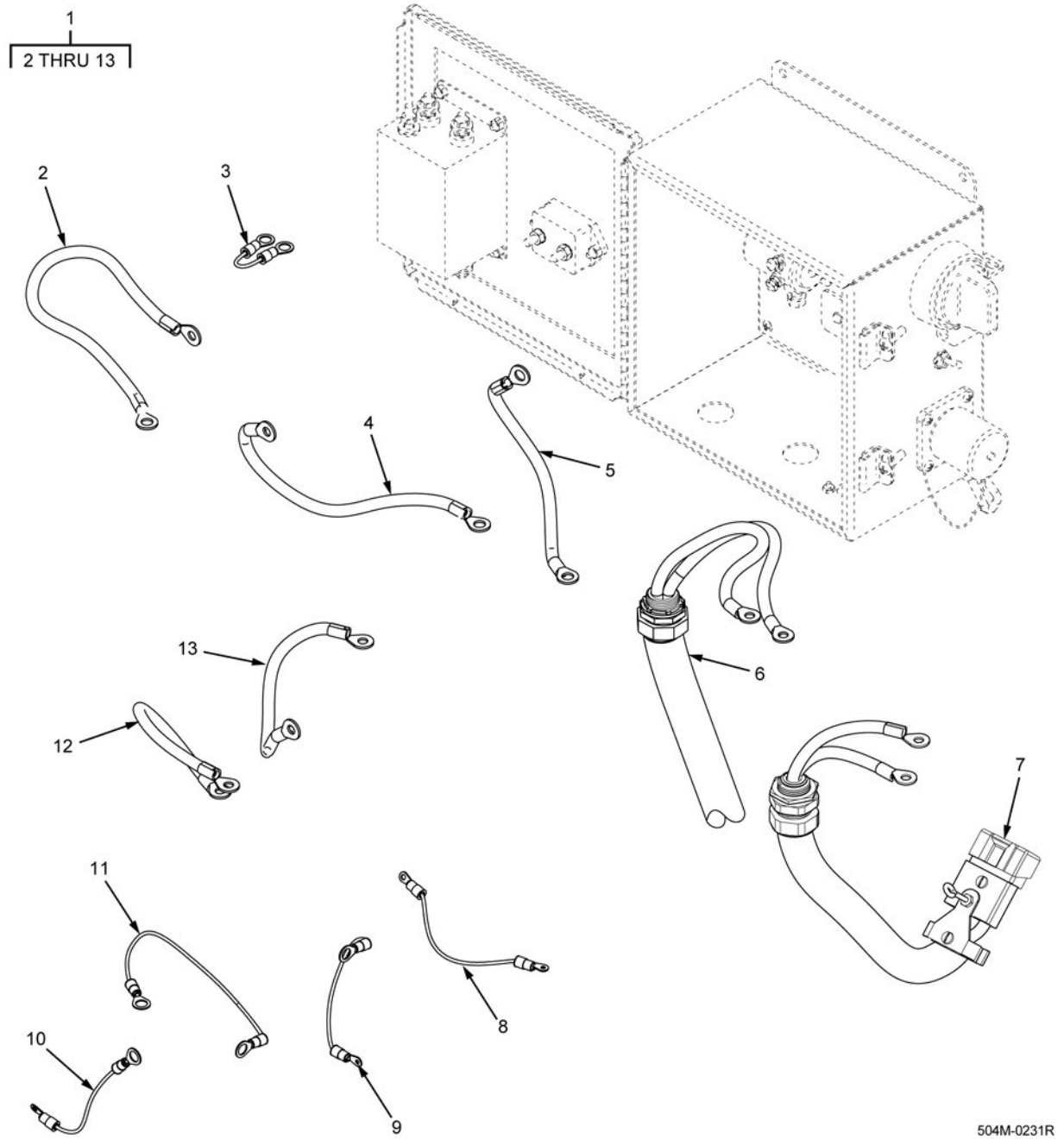


Figure 48. Power Control Box Wiring.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 0502 POWER CONTROL BOX WIRING	
					FIG. 48. POWER CONTROL BOX WIRING.	
1	XCFZZ		55242	1051G-30	POWER CONTROL BOX WIRING ASSEMBLY	1
* 2	PAFZZ	6150-01-663-0930	55242	1051G-20-02	. CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL (EMI CHANNEL FILTER TO GND)	1
* 3	PAFZZ	6150-01-663-0901	55242	1051G-21-05	. CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL (SHUNT WIRE)	1
* 4	PAFZZ	6150-01-663-0950	55242	1051G-20-05	. CABLE NATO SLAVE RECEPTACLE)	1
* 5	PAFZZ	6625-01-662-2580	55242	1051G-20-01	. CABLE ASSEMBLY,SPECIAL PURPOSE,ELECTRICAL TEST LEAD	1
* 6	PAFZZ	6150-01-665-7391	55242	1051G-24	. CABLE, POWER ELECTRICAL (ELECTRIC MOTOR POWER CABLE)	1
* 7	PAFZZ	5995-01-662-6571	55242	1051G-03	. CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL (NATO POWER CONNECTOR PIGTAIL)	1
* 8	PAFZZ	6150-01-662-4424	55242	1051G-21-01	. CABLE ASSEMBLY,SPECIAL PURPOSE,ELECTRICAL LEAD	1
* 9	PAFZZ	6150-01-663-0886	55242	1051G-21-02	. CABLE POWER CONTROL TOGGLE SWITCH)	1
* 10	PAFZZ	6150-01-662-4426	55242	1051G-21-04	. CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICALTEST LEAD (RELAY TO GND)	1
* 11	PAFZZ	6150-01-662-2416	55242	1051G-21-03	. CABLE (SWITCH)	1
* 12	PAFZZ	6150-01-663-0946	55242	1051G-20-04	. CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL (RELAY TO EMI CHANNEL FILTER)	1
* 13	PAFZZ	6625-01-662-2594	55242	1051G-20-03	. CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL TEST LEAD (CIRCUIT BREAKER TO RELAY)	1
					END OF FIGURE	

MAINTAINER
BII/COEI CABINET ASSEMBLY

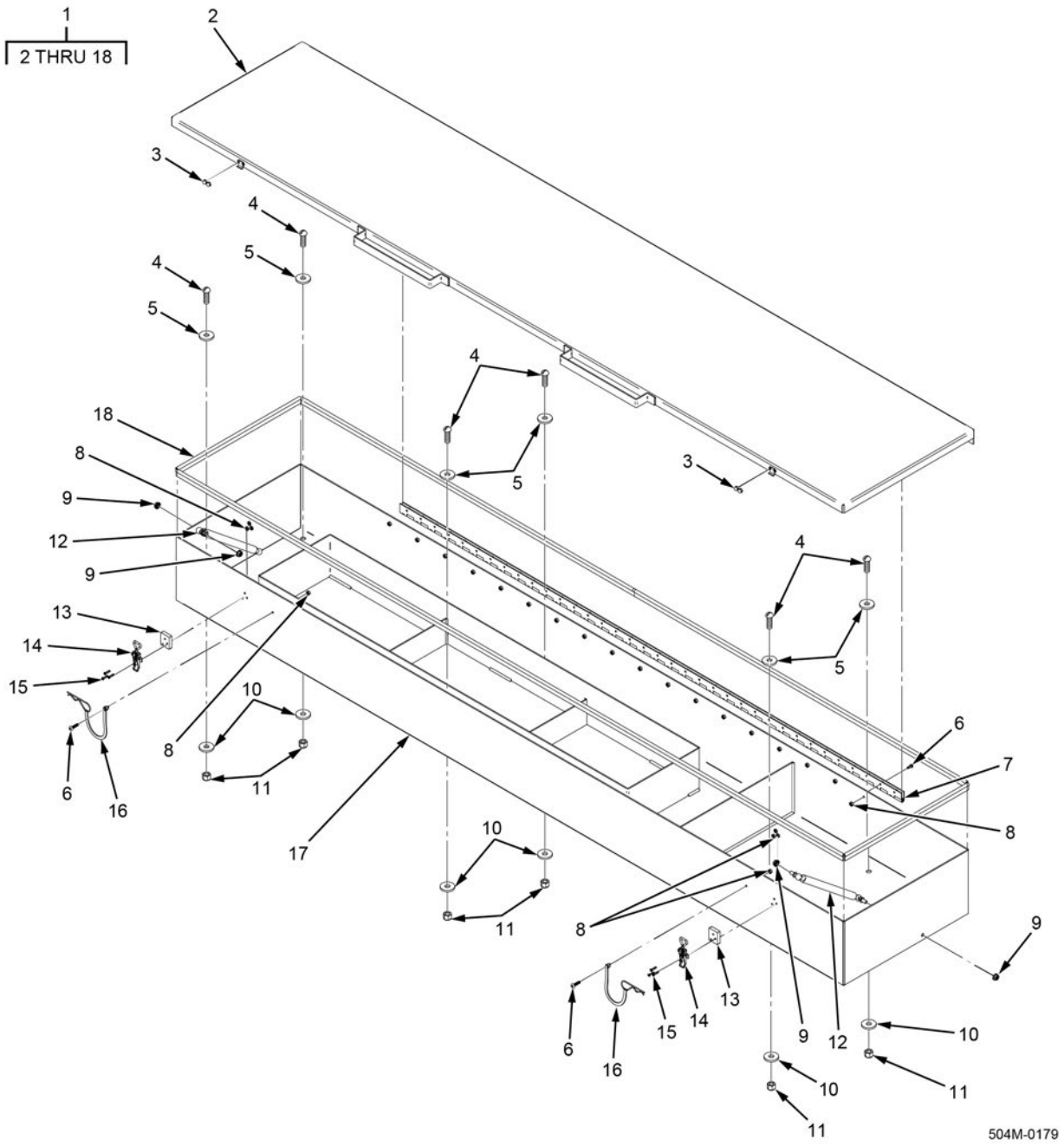


Figure 49. BII/COEI Cabinet Assembly.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 0600 BII\COEI CABINET ASSEMBLY	
					FIG. 49. BII/COEI CABINET ASSEMBLY.	
1	PDFFF	2540-01-662-2241	55242	1051A-04	BII/COEI CABINET ASSEMBLY.....	1
2	PAFZZ	5340-01-663-6829	55242	1051A-04-01	. CABINET,LID ASSEMBLY.....	1
* 3	PAFZZ	5310-01-677-1166	98960	4706P	. NUT, LOCKING,18-8 SS #8-32 ACORN.....	4
* 4	PAFZZ	5305-01-665-7286	05047	AESL4C500A50SB8 A31	. SCREW, ROUND, HEAD.....	6
* 5	PAFZZ	5310-01-666-5326	55242	ISO-1217	. WASHER,FLAT.....	6
* 6	PAFZZ	5305-01-665-7774	05047	AESF5C190500CH2 A31	. SCREW, MACHINE.....	21
* 7	PAFZZ	5340-01-664-9648	53755	SS074032-1013	. HINGE,PIANO.....	1
* 8	PAFZZ	5310-01-463-4929	39428	91831A011	. NUT,SELF-LOCKING,HEXAGON.....	27
* 9	PAFZZ	5310-01-592-2747	39428	94831A030	. NUT,SERRATED FLANGE.....	4
* 10	PAFZZ	5310-01-665-0387	05047	AEW24X50N000SB8 A31	. WASHER, FLAT.....	6
* 11	PAFZZ	5310-01-475-9155	39428	91831A137	. NUT,SELF-LOCKING,HEXAGON.....	6
* 12	PAFZZ	2540-20-010-6113	L00E3	465.4.07.150.432.13 5.416	. CYLINDER ASSEMBLY,REACTION.....	2
13	PAFZZ	5365-01-662-1716	55242	1051A-04-05	. LATCH SPACER.....	2
* 14	PAFZZ	5340-01-665-4202	55242	1051A-34	. DRAW LATCH.....	2
* 15	PAFZZ	5305-01-563-7464	3A054	91500A242	. SCREW, MACHINE.....	6
16	PAFZZ	4010-01-663-6852	55242	1051A-04-25	. SASH CHAIN W/ HITCH PIN.....	2
17	PAFZZ	2540-01-662-2229	55242	1051A-04-02	. BII BOX WELDMENT.....	1
18	PCFZZ	5330-01-663-6984	55242	1051A-04-23	. BOX EDGE SEAL GASKET.....	1
					END OF FIGURE	

MAINTAINER
MFS TRM TO HEMTT HOSE

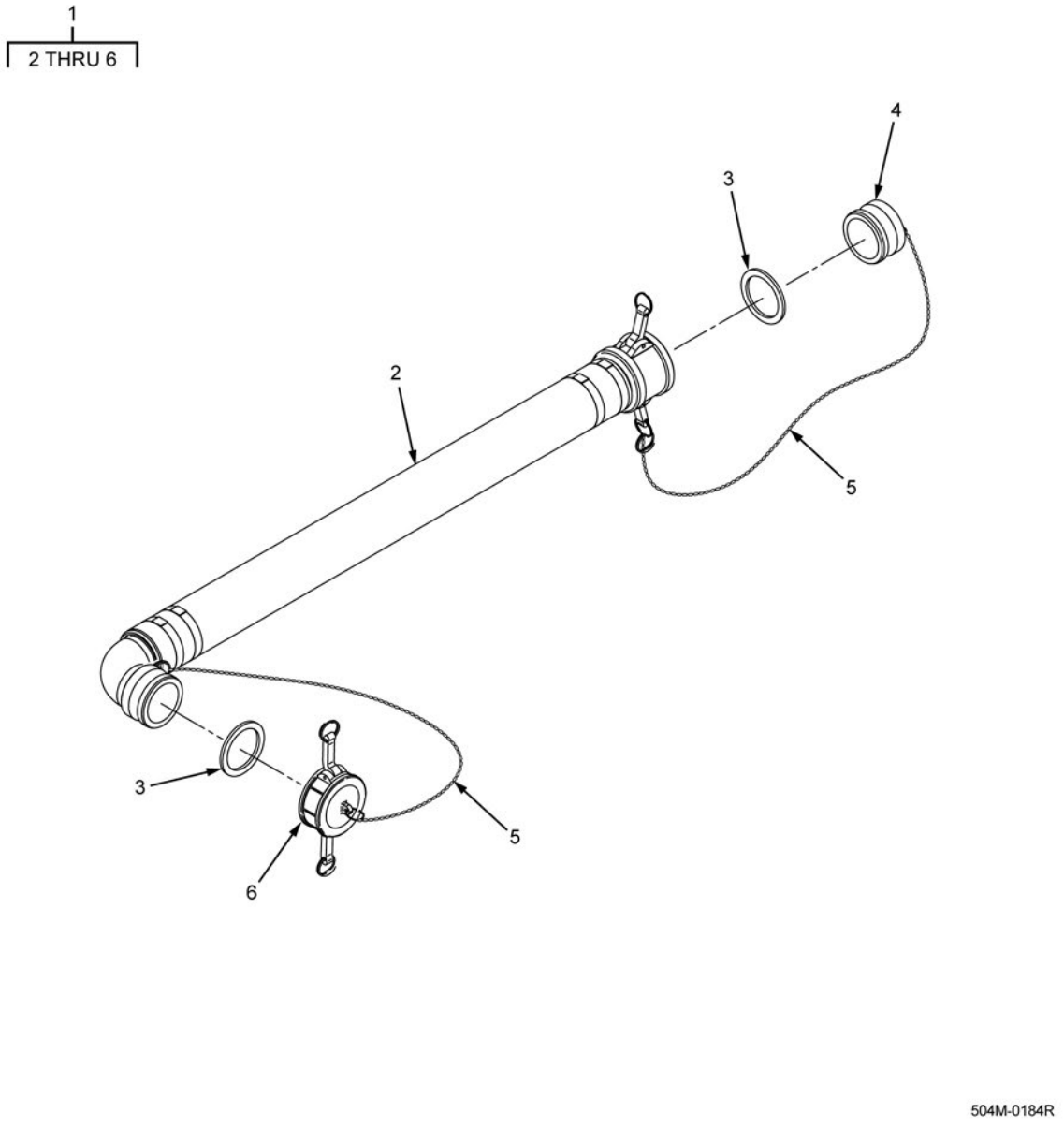


Figure 50. MFS TRM To HEMTT Hose.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 0700 MFS TRM TO HEMTT HOSE	
					FIG. 50. MFS TRM TO HEMTT HOSE.	
1	PCFFF	4720-01-657-8288	55242	1051A-27	MFS TRM TO HEMTT HOSE	1
2	XAFZZ		55242	1051A-27-01	. HOSE,FUEL	1
3	PCOZZ	5330-00-612-2415	58536	AA59326-G8	. GASKET	2
* 4	PAFZZ	5340-01-666-0927	72661	300-DP-AL	. CAP, PROTECTIVE,DUST AND MOISTURE	1
5	PAFZZ	4010-01-663-7933	55242	1051F-25	. SASH CHAIN W/ SPLIT RINGS	2
* 6	PAFZZ	4730-00-929-0787	24869	AA59326/10-8-A	. CAP, PROTECTIVE,DUST AND MOISTURE	1
					END OF FIGURE	

MAINTAINER
2-INCH HOSE ASSEMBLY

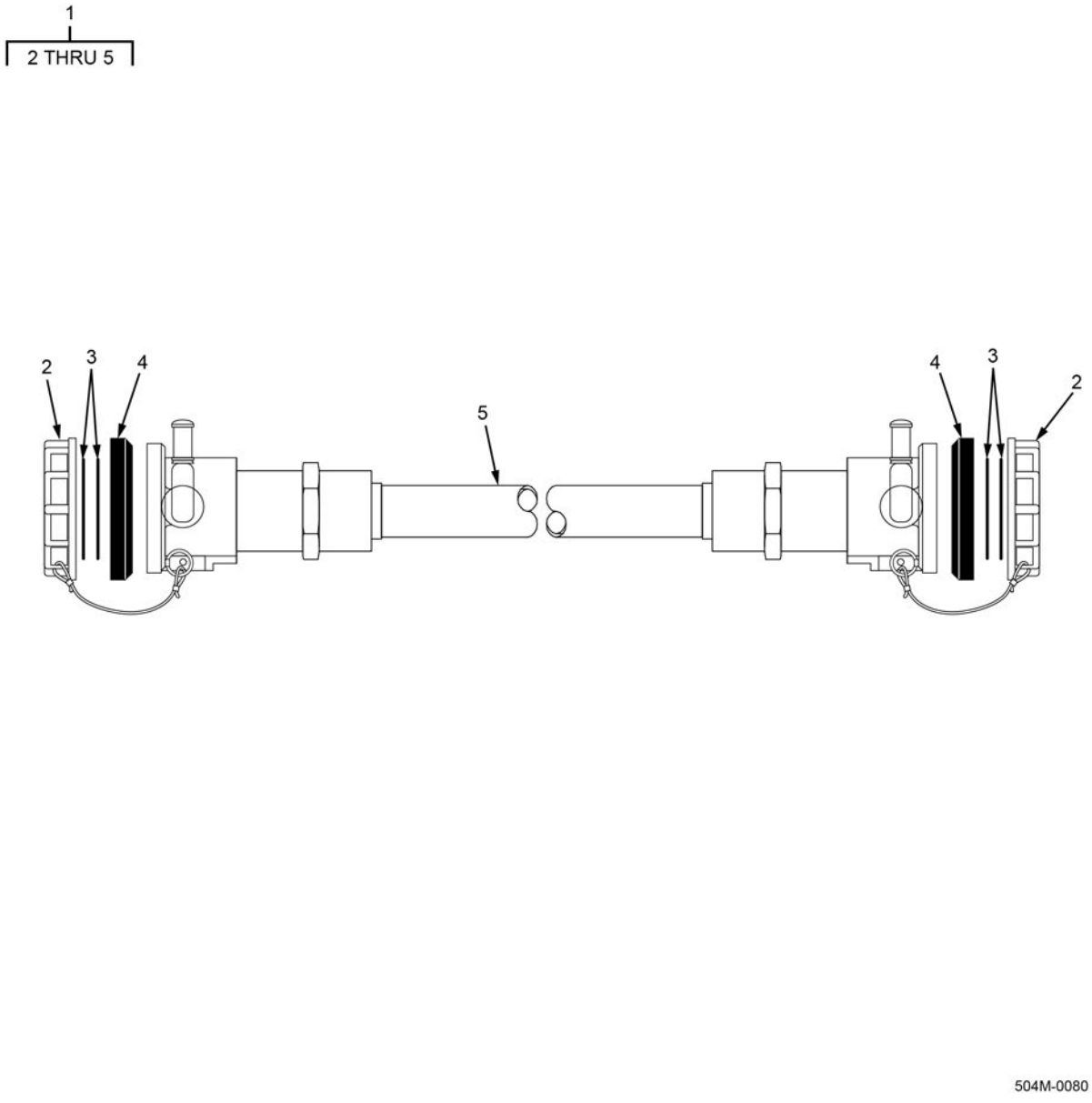


Figure 51. 2-Inch Hose Assembly.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 0800 2-INCH HOSE ASSEMBLY	
					FIG. 51. 2-INCH HOSE ASSEMBLY.	
1	PCFFF	4720-01-657-8287	55242	1051A-08	2-INCH HOSE ASSEMBLY, PRESSURE TESTED, WITH FITTINGS.....	1
* 2	PAFZZ	5340-01-645-2593	1WG21	RJA1002	. DUST CAP (INCLUDES LANYARD AND SPLIT RING).....	2
3	PCOZZ	5330-01-641-3634	1WG21	RJ0009	. SEAL, PLAIN.....	4
4	PCOZZ	2510-01-641-3811	1WG21	RJ0001	. CAP, BUMPER.....	2
5	XAFZZ		55242	1051A-08-01	. FUEL HOSE.....	1
					END OF FIGURE	

MAINTAINER
4-INCH HOSE ASSEMBLY

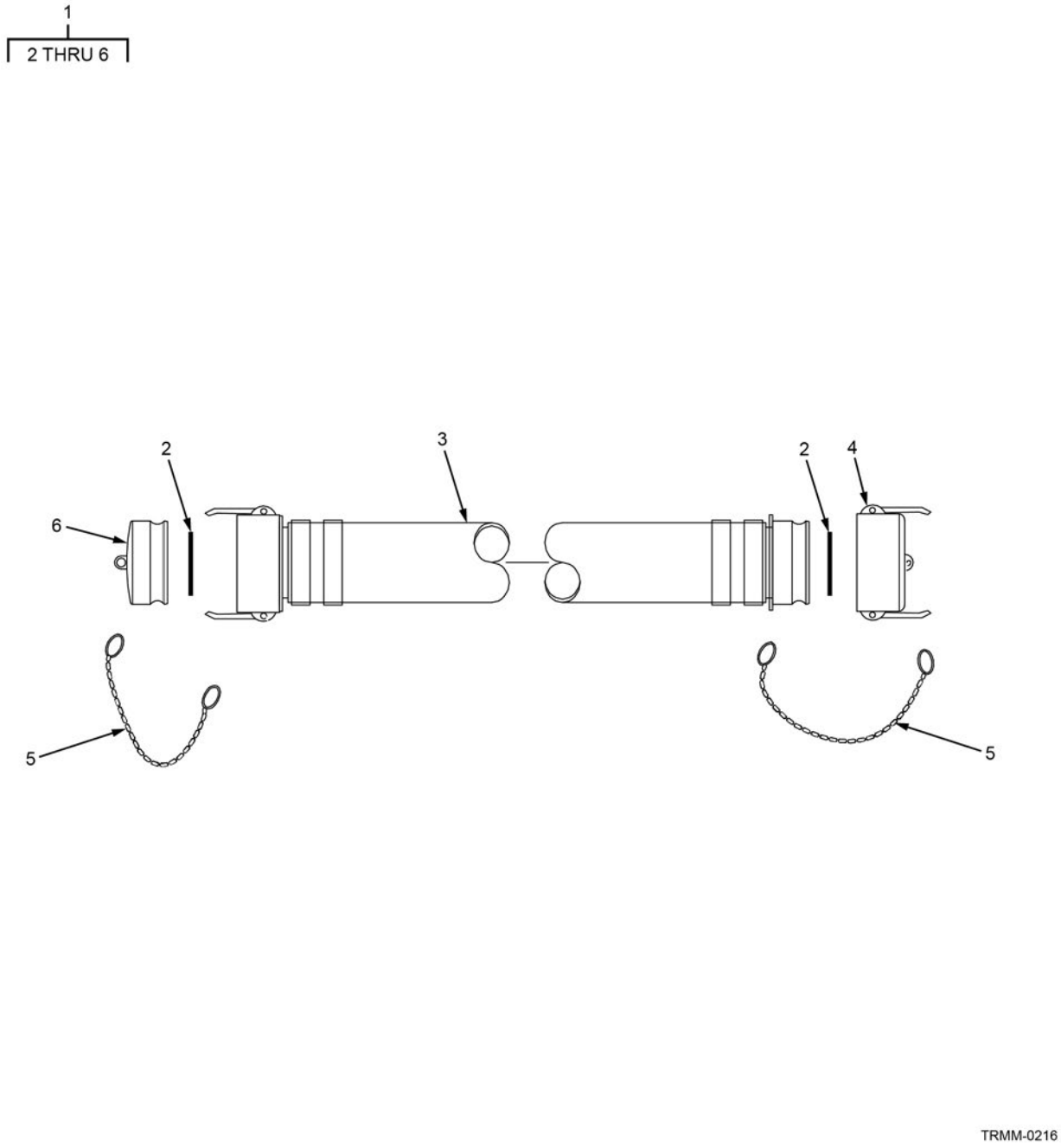


Figure 52. 4-Inch Hose Assembly.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 0900 4-INCH HOSE ASSEMBLY	
					FIG. 52. 4-INCH HOSE ASSEMBLY.	
1	PCFFF	4720-01-656-2860	55242	1051A-03-15	4-INCH HOSE ASSEMBLY (15 FT.), PRESSURE TESTED, WITH FITTINGS.....	1
1	PCFFF	4720-01-657-8272	55242	1051A-03-08	4-INCH HOSE ASSEMBLY (8 FT.), PRESSURE TESTED, WITH FITTINGS.....	1
1	PCFFF	4720-01-657-8268	55242	1051A-03-06	4-INCH HOSE ASSEMBLY (6 FT.), PRESSURE TESTED, WITH FITTINGS.....	1
2	PCOZZ	5330-01-577-5200	72661	400-G-BU	. GASKET.....	2
3	XAFZZ		61125	M370B091A0150A	. FUEL HOSE.....	1
3	XAFZZ		61125	M370B091A0080A	. FUEL HOSE.....	1
3	XAFZZ		61125	M370B091A0060A	. FUEL HOSE.....	1
* 4	PAFZZ	5340-01-666-0925	72661	400-DC-AL	. CAP,PROTECTIVE,DUST AND MOISTURE SEAL.....	1
* 5	PAFZZ	4010-01-663-7933	55242	1051F-25	. WIRE ROPE ASSEMBLY,SINGLE LEG (SASH CHAIN W/SPLIT RINGS).....	2
* 6	PAFZZ	5340-01-665-6744	72661	404-DP-AL	. CAP,PROTECTIVE,DUST AND MOISTURE SEAL.....	1
					END OF FIGURE	

MAINTAINER
FUEL NOZZLE ASSEMBLY

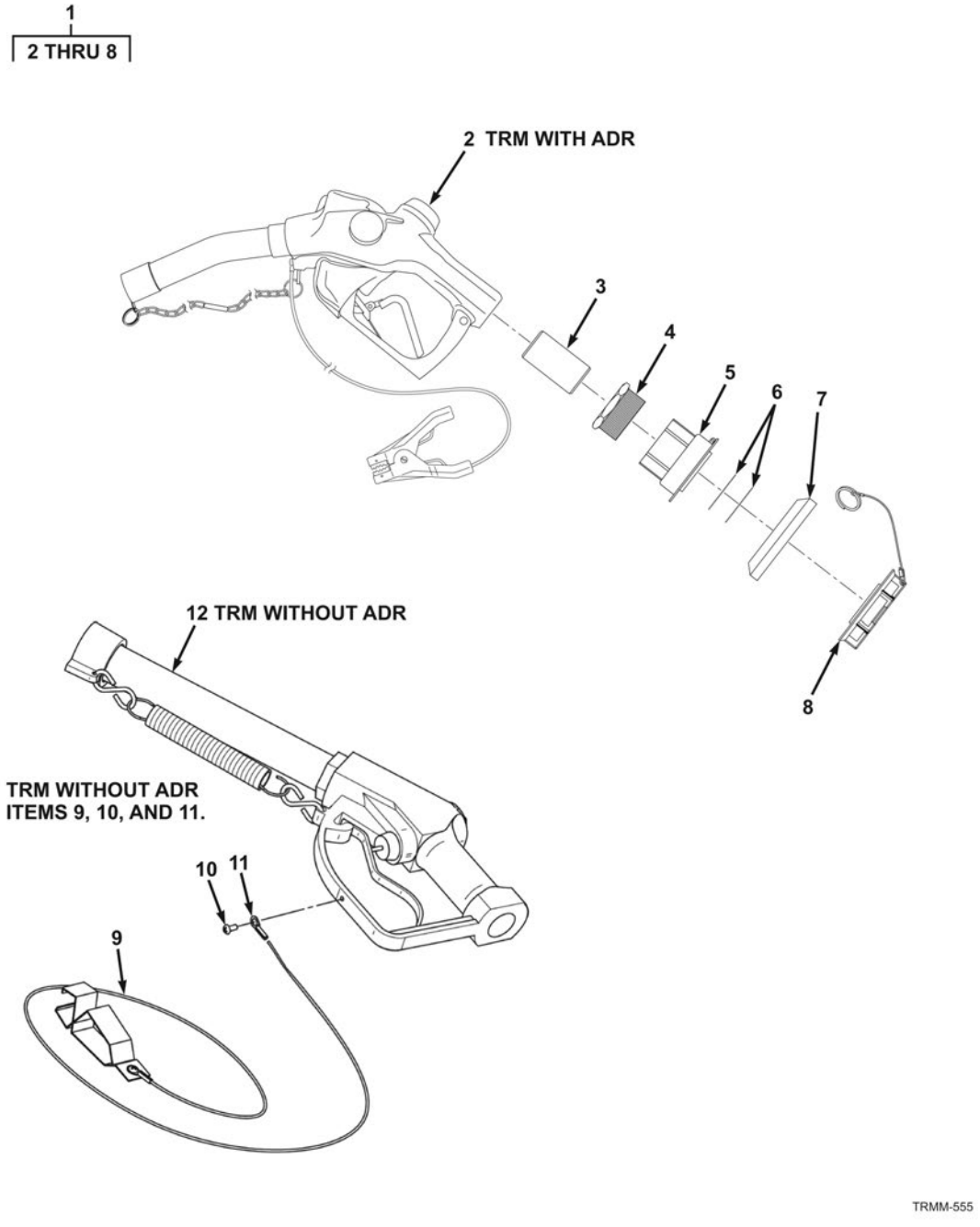


Figure 53. Fuel Nozzle Assembly.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 1000 FUEL NOZZLE ASSEMBLY	
					FIG. 53. FUEL NOZZLE ASSEMBLY.	
1	PAFFF	4930-01-661-7722	55242	1051A-13	FUEL NOZZLE ASSEMBLY	1
* 2	PAFZZ	4930-01-697-4809	8H186	1456512N	. NOZZLE,OPEN PORT AUTO SHUTOFF, (TRM WITH ADR)	1
3	PAFZZ	4730-00-975-0324	39428	4830K221	. NIPPLE	1
4	PAFZZ	4730-01-481-8182	39428	4429K426	. BUSHING,REDUCER, BRASS	1
* 5	PAFZZ	4730-01-665-5245	1WG21	USC10112	. DRYBREAK COUPLING, NON-VALVED	1
6	PCOFF	5330-01-641-3634	1WG21	RJ0009	. . SEAL, PLAIN	2
7	PCOFF	2510-01-641-3811	1WG21	RJ0001	. . CAP, BUMPER	1
* 8	PAFZZ	5340-01-665-1804	1WG21	RJA1154	. . DUST CAP (INCLUDES LANYARD AND SPLIT RING)	1
* 9	PAFZZ	5999-01-665-6354	55242	1051-13-02	. NOZZLE GROUND WIRE ASSEMBLY (TRM WITHOUT ADR)	1
* 10	PAFZZ	5305-01-666-0908	05047	AESF5C164375CH2A31	. SCREW,MACHINE (TRM WITHOUT ADR)	1
* 11	PAFZZ	5940-01-665-6358	55242	7113K551	. TERMINAL,LUG (TRM WITHOUT ADR)	1
* 12	PAFZZ	4930-01-582-7514	41592	300ALMM 200 ANAJ	. FUEL NOZZLE (TRM WITHOUT ADR)	1
					END OF FIGURE	

MAINTAINER
VAPOR RECOVERY LINE ASSEMBLY

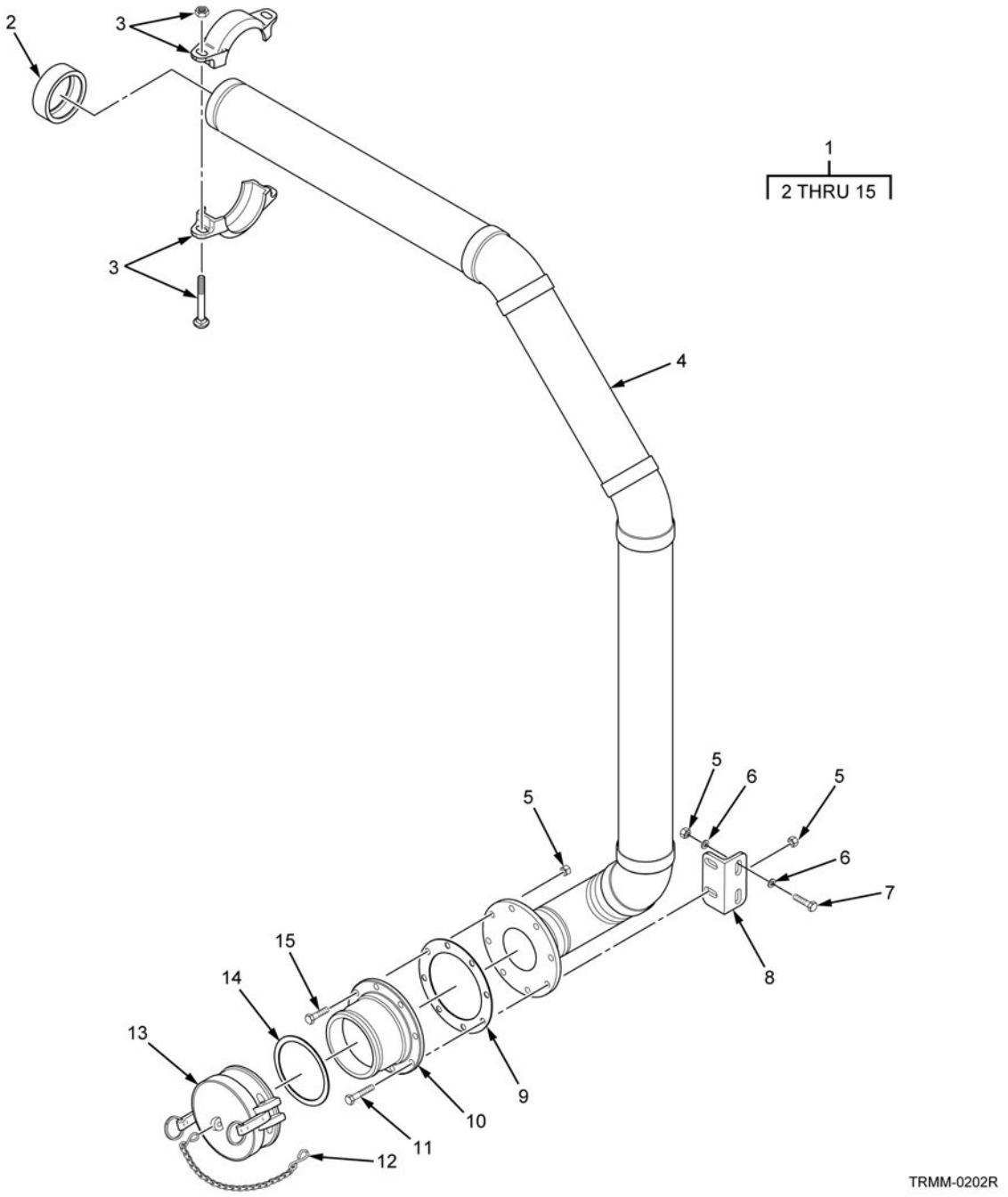


Figure 54. Vapor Recovery Line Assembly.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 1200 VAPOR RECOVERY LINE ASSEMBLY	
					FIG. 54. VAPOR RECOVERY LINE ASSEMBLY.	
1	XCFZZ		55242	1051A-09	VAPOR RECOVERY LINE ASSEMBLY.....	1
2	PCFZZ	5330-00-391-8491	79154	G030077LT0	. GASKET.....	1
3	PAFZZ	4730-00-855-4919	79154	L030075PT0	. COUPLING,CLAMP,PIPE (INCLUDES COUPLING HALVES, BOLTS, AND NUTS).....	1
4	PAFZZ	4710-01-662-4976	55242	1051A-09-10	. VAPOR RECOVERY LINE.....	1
* 5	PAFZZ	5310-01-475-9244	39428	91831A127	. NUT,SELF-LOCKING,HEXAGON.....	10
* 6	PAFZZ	5310-01-665-0457	05047	AEW24X37N000SB8 A31	. WASHER, FLAT.....	6
* 7	PAFZZ	5305-01-665-1734	05047	AEB02C375A25CH2 A31	. SCREW,CAP,HEXAGON HEAD.....	2
8	PAFZZ	5340-01-662-4973	55242	1051A-09-07	. BRACKET,VAPOR PIPE.....	1
* 9	PCFZZ	5330-01-577-5200	72661	400-G-BU	. GASKET.....	1
* 10	PAFZZ	4730-01-665-4041	72661	G400-ALT-AL	. COUPLING HALF,QUICK DISCONNECT.....	1
* 11	PAFZZ	5306-01-665-3853	05047	AEB02C375A75CH2 A31	. BOLT, MACHINE.....	2
12	PAFZZ	4010-01-663-6041	55242	1051F-18-01	. SASH CHAIN W/ S-HOOKS.....	1
* 13	PAFZZ	5340-01-666-0925	72661	400-DC-AL	. CAP,PROTECTIVE,DUST AND MOISTURE SEAL.....	1
14	PCFZZ	5330-00-899-4509	58536	AA59326-G-9	. GASKET,.....	1
* 15	PAFZZ	5306-01-665-1752	05047	AEB02C375A50CH2 A31	. SCREW,CAP,HEXAGON HEAD.....	6
					END OF FIGURE	

MAINTAINER
STOWABLE LADDER ASSEMBLY

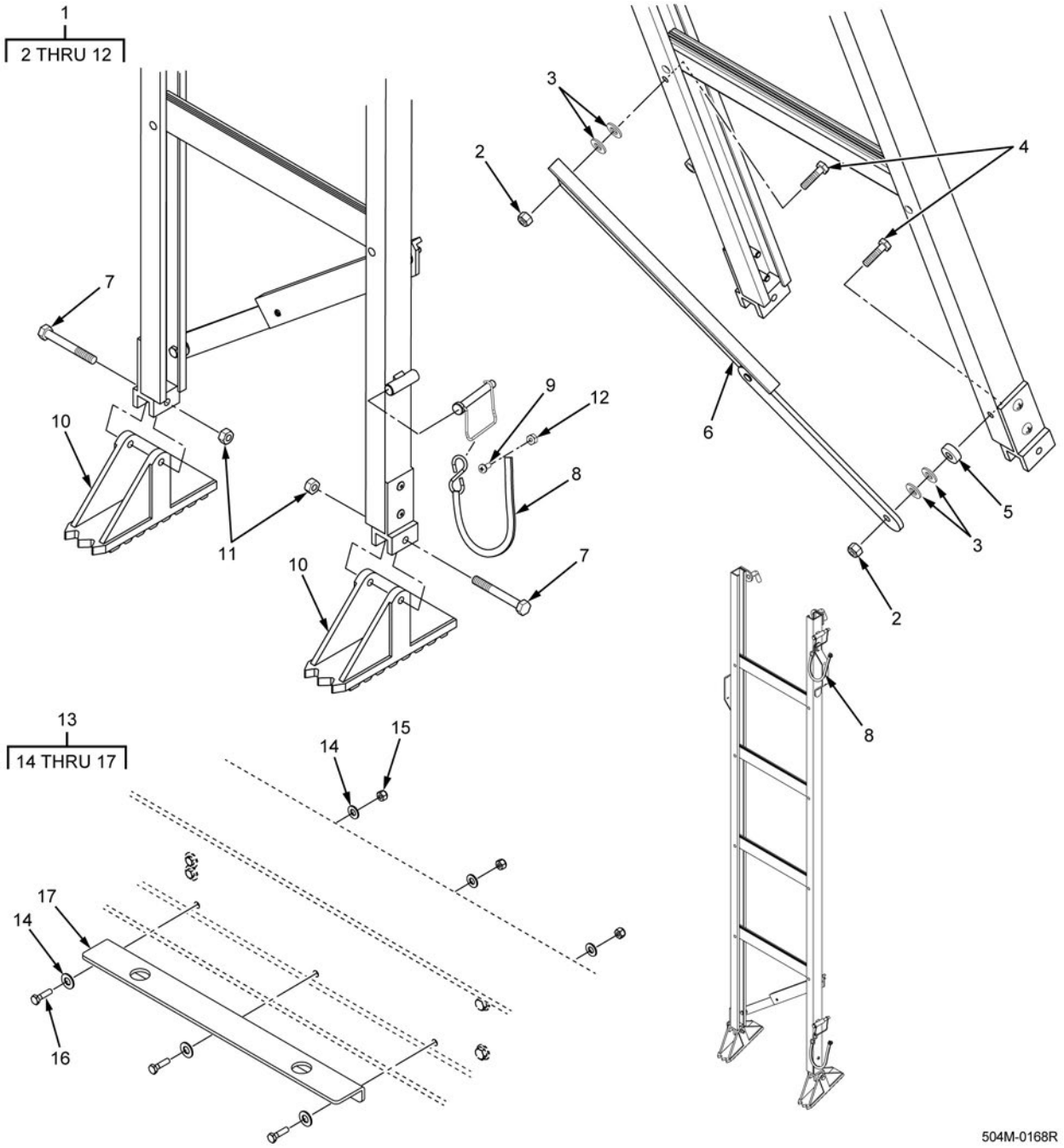


Figure 55. Stowable Ladder Assembly.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 1300 STOWABLE LADDER ASSEMBLY	
					FIG. 55. STOWABLE LADDER ASSEMBLY.	
1	PAFFF	4940-01-657-8321	55242	1051A-05	STOWABLE LADDER ASSEMBLY	1
* 2	PAFZZ	5310-01-416-1851	39428	91831A029	. NUT,SELF-LOCKING,HEXAGON	2
* 3	PAFZZ	5310-01-665-0396	05047	AEW24X25N000SB8A31	. WASHER, FLAT	4
* 4	PAFZZ	5306-01-665-3500	05047	AEB02C250A00CH2A31	. BOLT,MACHINE	2
5	PAFZZ	5365-01-662-7720	55242	ISO-1215	. SPACER	1
6	PAFZZ	5340-01-663-6989	55242	1051A-05-13	. FOLDING LOCK BAR ASSEMBLY	1
* 7	PAFZZ	5306-01-664-9631	05047	AEB02C312B50CH2A31	. BOLT,MACHINE	2
8	PAFZZ	5315-01-663-6263	55242	1051A-42	. LOCKING PIN W/ SASH CHAIN AND S-HOOK	2
* 9	PAFZZ	5305-01-665-7774	05047	AESF5C190500CH2A31	. SCREW, MACHINE	2
10	PAFZZ	5340-01-663-6623	55242	1051A-05-07	. STOWABLE LADDER FOOT	2
* 11	PAFZZ	5310-01-499-3569	2V507	91831A030	. NUT,SELF-LOCKING,HEXAGON	2
* 12	PAFZZ	5310-01-463-4929	39428	91831A011	. NUT,SELF-LOCKING,HEXAGON	2
13	XCFZZ		55242	1051C-01-80	STOWABLE LADDER MOUNT ASSEMBLY	1
* 14	PAFZZ	5310-01-665-0396	05047	AEW24X25N000SB8A31	. WASHER, FLAT	6
* 15	PAFZZ	5310-01-416-1851	39428	91831A029	. NUT,SELF-LOCKING,HEXAGON	3
* 16	PAFZZ	5306-01-665-3500	05047	AEB02C250A00CH2A31	. BOLT,MACHINE	3
17	PAFZZ	2590-01-662-2240	55242	1051C-01-80-01	. BRACKET,STOWABLE LADDER BAR MOUNT	1
					END OF FIGURE	

MAINTAINER
STEP ASSEMBLY, VEHICULAR (LADDER PLATFORM)

1
2 THRU 4

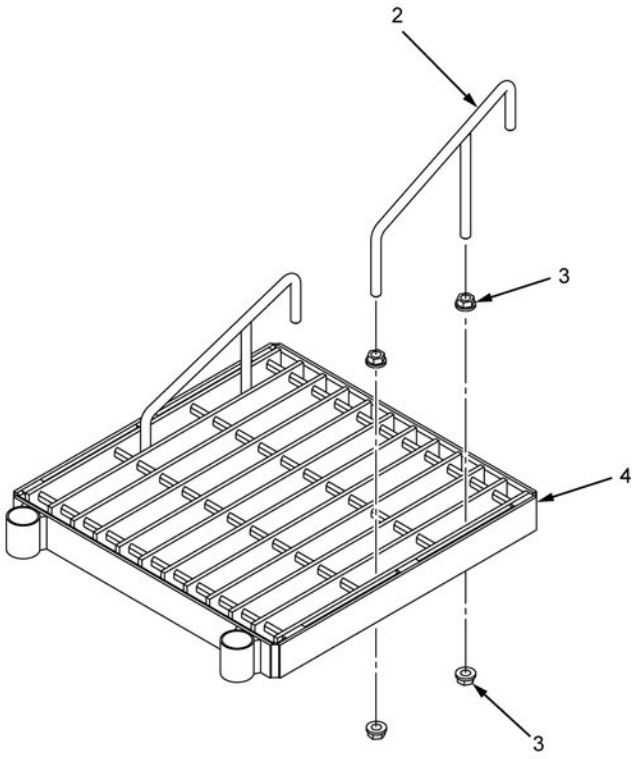


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Figure 56. Step Assembly, Vehicular (Ladder Platform).

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 1400 STEP ASSEMBLY, VEHICULAR (LADDER PLATFORM)	
					FIG. 56. STEP ASSEMBLY, VEHICULAR (LADDER PLATFORM).	
1	PAFFF	2590-01-656-1220	55242	1051A-28	STEP ASSEMBLY, VEHICULAR (LADDER PLATFORM).....	1
2	PAFZZ	2590-01-663-6609	55242	1051A-28-11	. PLS PLATFORM HOOK.....	2
* 3	PAFZZ	5310-01-466-8127	39428	93776A461	. NUT,SERRATED FLANGE LOCKNUT.....	8
* 4	PAFZZ	2590-01-665-3190	55242	1051A-28-08	. LADDER PLATFORM.....	1
					END OF FIGURE	

MAINTAINER
FIXED LADDER ASSEMBLY

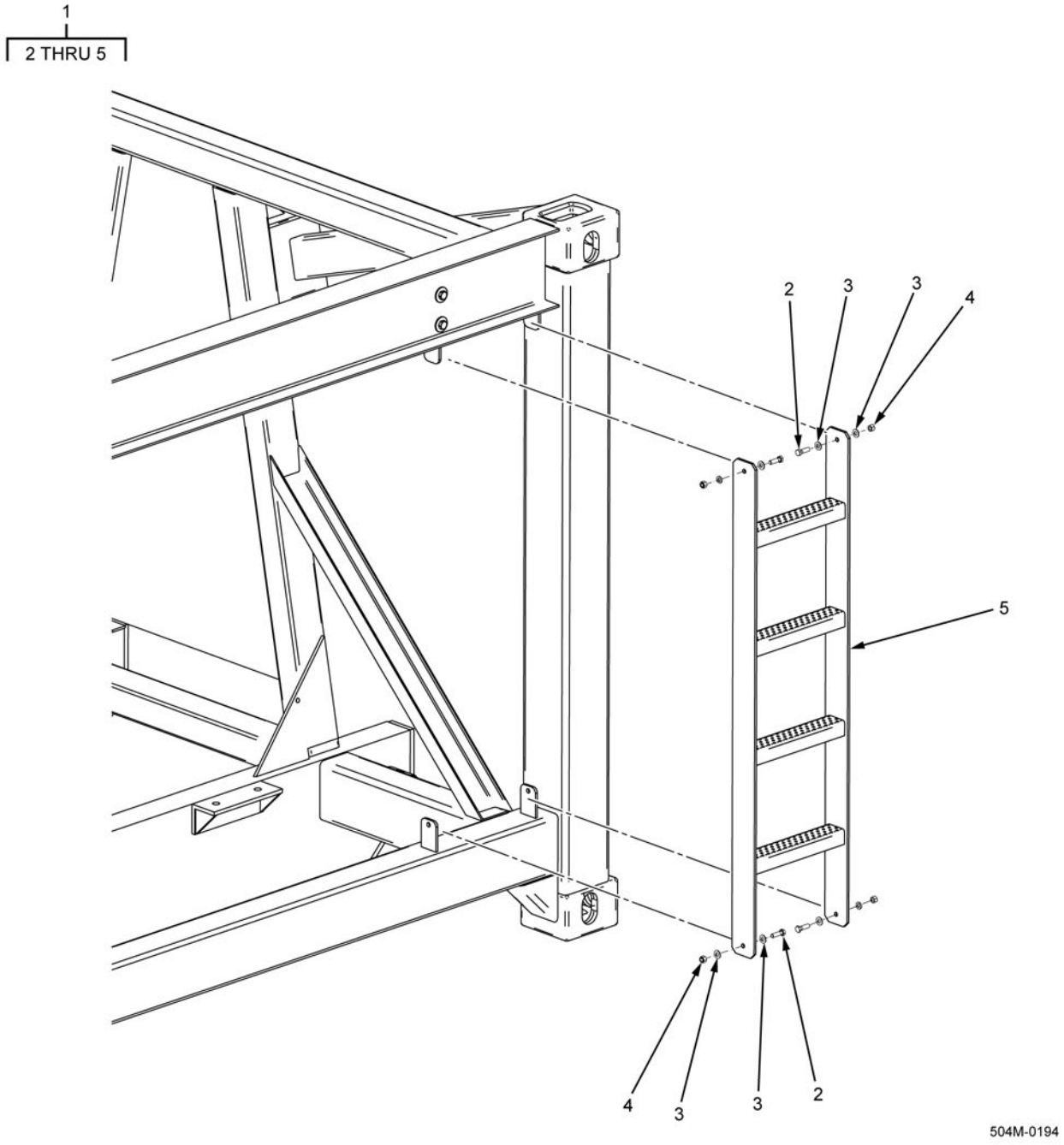


Figure 57. Fixed Ladder Assembly.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 1500 FIXED LADDER ASSEMBLY	
					FIG. 57. FIXED LADDER ASSEMBLY.	
1	XCFZZ		55242	1051C-03	FIXED LADDER ASSEMBLY.....	1
* 2	PAFZZ	5305-01-665-1734	05047	AEB02C375A25CH2A31	. SCREW,CAP,.....	4
* 3	PAFZZ	5310-01-665-0457	05047	AEW24X37N000SB8A31	. WASHER, FLAT.....	8
* 4	PAFZZ	5310-01-475-9244	39428	91831A127	. NUT,SELF-LOCKING, HEXAGON.....	4
* 5	PAFZZ	2540-01-662-1694	55242	1051C-03-03	. FIXED LADDER WELDMENT.....	1
					END OF FIGURE	

MAINTAINER
HOSE TUBE CABINET ASSEMBLY

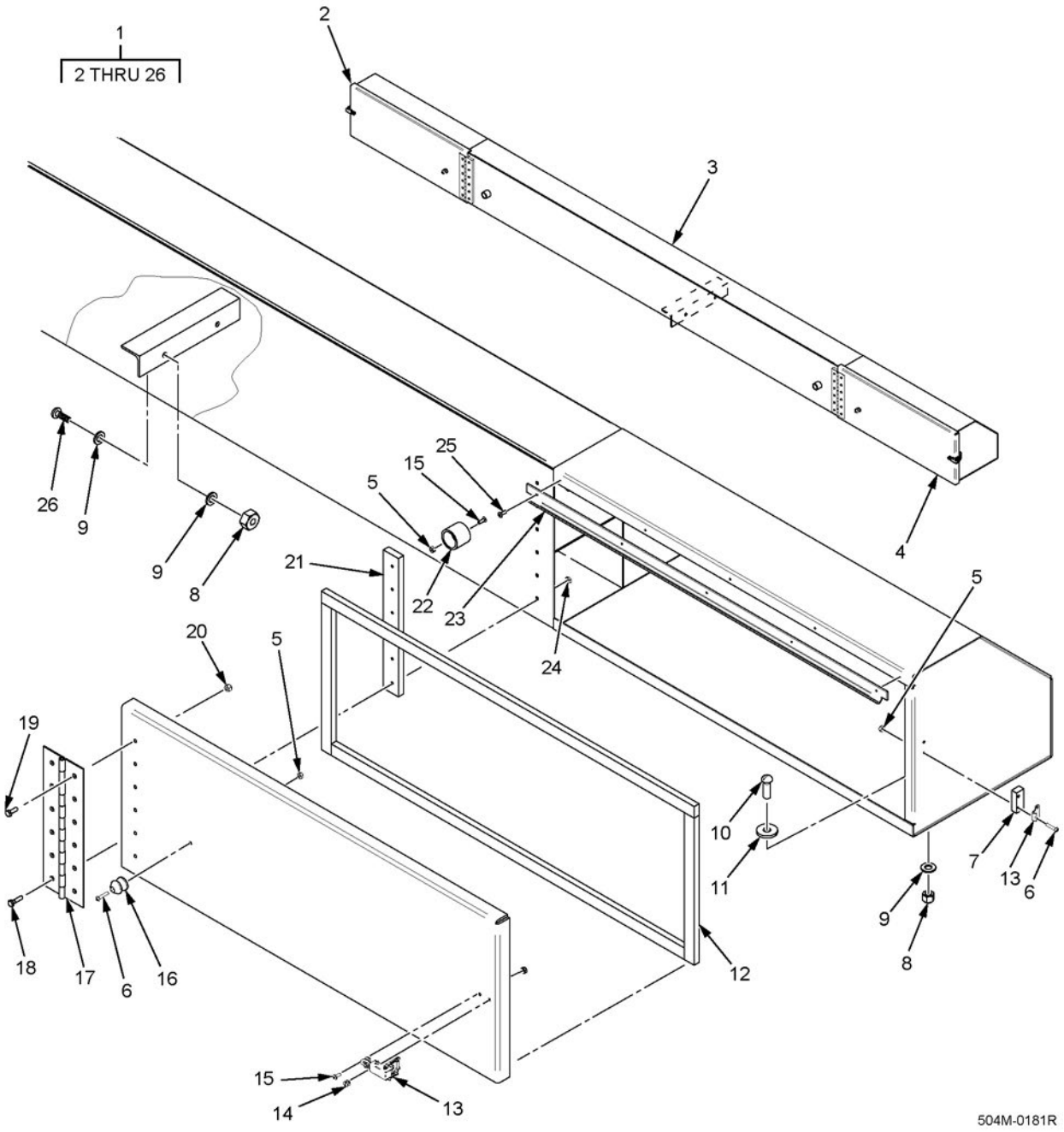


Figure 58. Hose Tube Cabinet Assembly.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 1600 HOSE TUBE CABINET ASSEMBLY	
					FIG. 58. HOSE TUBE CABINET ASSEMBLY.	
1	PDFFF	4720-01-662-6915	55242	1051A-02	HOSE TUBE BOX ASSEMBLY	1
2	PAFZZ	2590-01-662-5227	55242	1051A-02-06	. DOOR,HOSE TUBE, LH	1
* 3	PAFZZ	4720-01-665-4097	55242	1051A-02-32	. BOX,HOSE TUBE	1
4	PAFZZ	2590-01-662-6111	55242	1051A-02-07	. DOOR,HOSE TUBE, RH	1
* 5	PAFZZ	5310-01-463-4929	39428	91831A011	. NUT,SELF-LOCKING,HEXAGON	10
* 6	PAFZZ	5305-01-665-7344	05047	AESF5C190A00CH2 A31	. SCREW (PAN HEAD)	6
7	PAFZZ	5362-01-662-1684	55242	1051A-02-20	. DOOR LATCH KEEPER S	2
* 8	PAFZZ	5310-01-475-9155	39428	91831A137	. NUT,SELF-LOCKING,	6
* 9	PAFZZ	5310-01-665-0387	05047	AEW24X50N000SB8 A31	. WASHER, FLAT	8
* 10	PAFZZ	5305-01-665-7286	05047	AESL4C500A50SB8 A31	. SCREW, ROUND, HEAD	4
* 11	PAFZZ	5310-01-666-5326	55242	ISO-1217	. WASHER, FLAT	4
12	PCFZZ	5330-01-663-6879	55242	1051A-02-30	. DOOR GASKET INSULAT	2
* 13	PAFZZ	5340-01-665-1702	55242	1051A-32	. LATCH, THUMB	2
14	PAFZZ	5940-01-630-7706	81337	13-1-0773	. POST,BINDING	2
* 15	PAFZZ	5305-01-665-7774	05047	AESF5C190500CH2 A31	. SCREW, MACHINE	4
16	PCFZZ	5340-01-663-7924	19220	666-2-MB	. MALE STEM DOOR HOLD	2
* 17	PAFZZ	5340-01-664-9682	53755	SS093064-881	. HINGE,PIANO	2
* 18	PAFZZ	5306-01-665-3500	05047	AEB02C250A00CH2 A31	. BOLT,MACHINE	12
* 19	PAFZZ	5305-01-665-1749	05047	AEB02C250750CH2 A31	. SCREW,CAP,	12
* 20	PAFZZ	5310-01-416-1851	39428	91831A029	. NUT,SELF-LOCKING,HEXAGON	12
21	PAFZZ	5365-01-662-1094	55242	1051A-02-14	. CABINET DOOR HINGE SPACER	2
22	PCFZZ	5340-01-663-6109	19220	777-1	. FEMALE BASE DOOR HO	2
23	PAFZZ	2590-01-662-2235	55242	1051A-02-21	. DOOR GUTTER	2
* 24	PAFZZ	5310-01-475-9155	39428	91831A137	. NUT,SELF-LOCKING,HEXAGON	12
25	PAFZZ	5320-01-491-1442	75Q65	3289283	. RIVET,BLIND	10
* 26	PAFZZ	5305-01-665-1750	05047	AEB02C500A75CH2 A31	. SCREW,CAP,HEXAGON HEAD (BOLT)	2
					END OF FIGURE	

MAINTAINER
FILTER/SEPARATOR ASSEMBLY

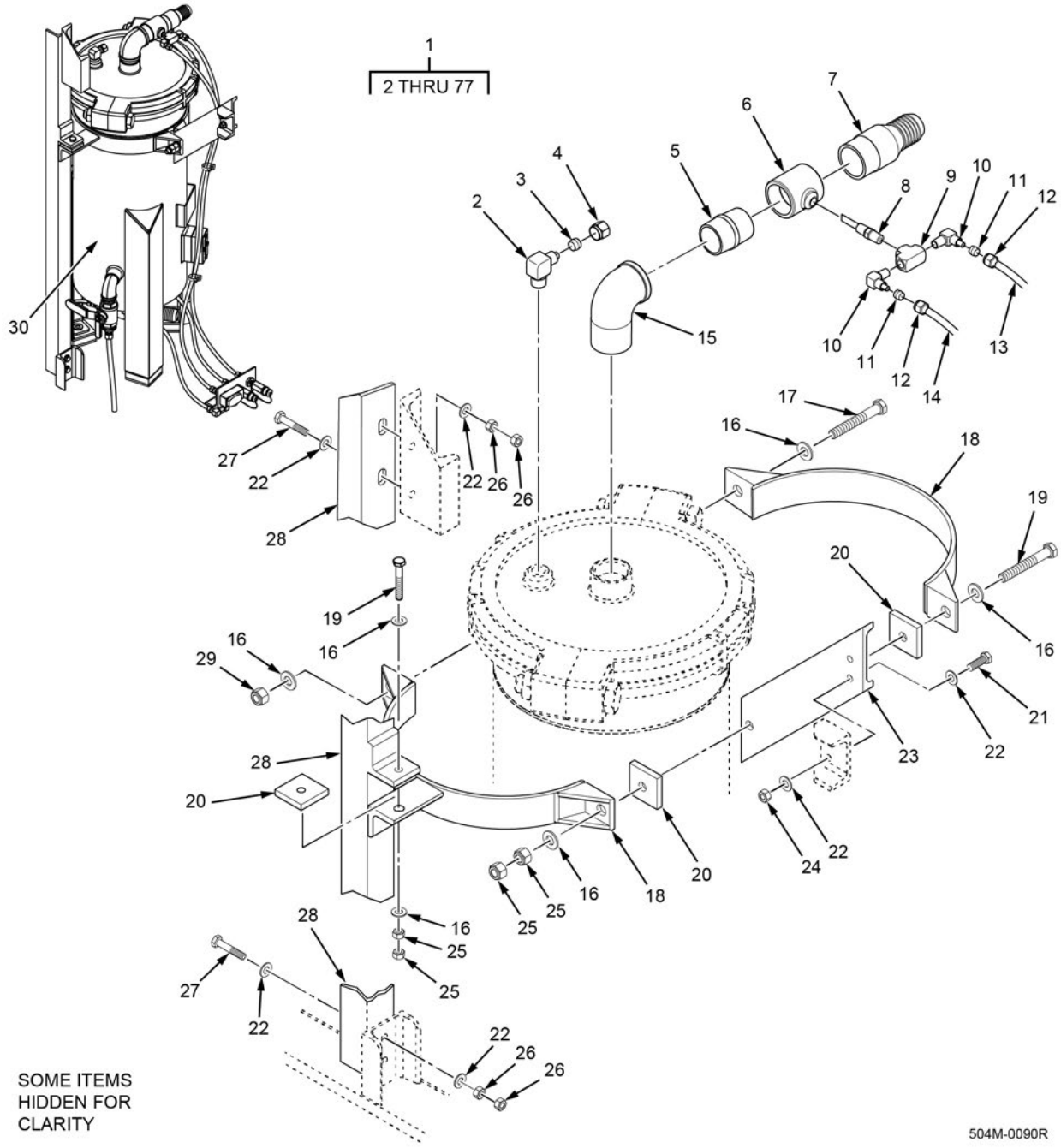


Figure 59. Filter/Separator Assembly (Sheet 1 of 4).

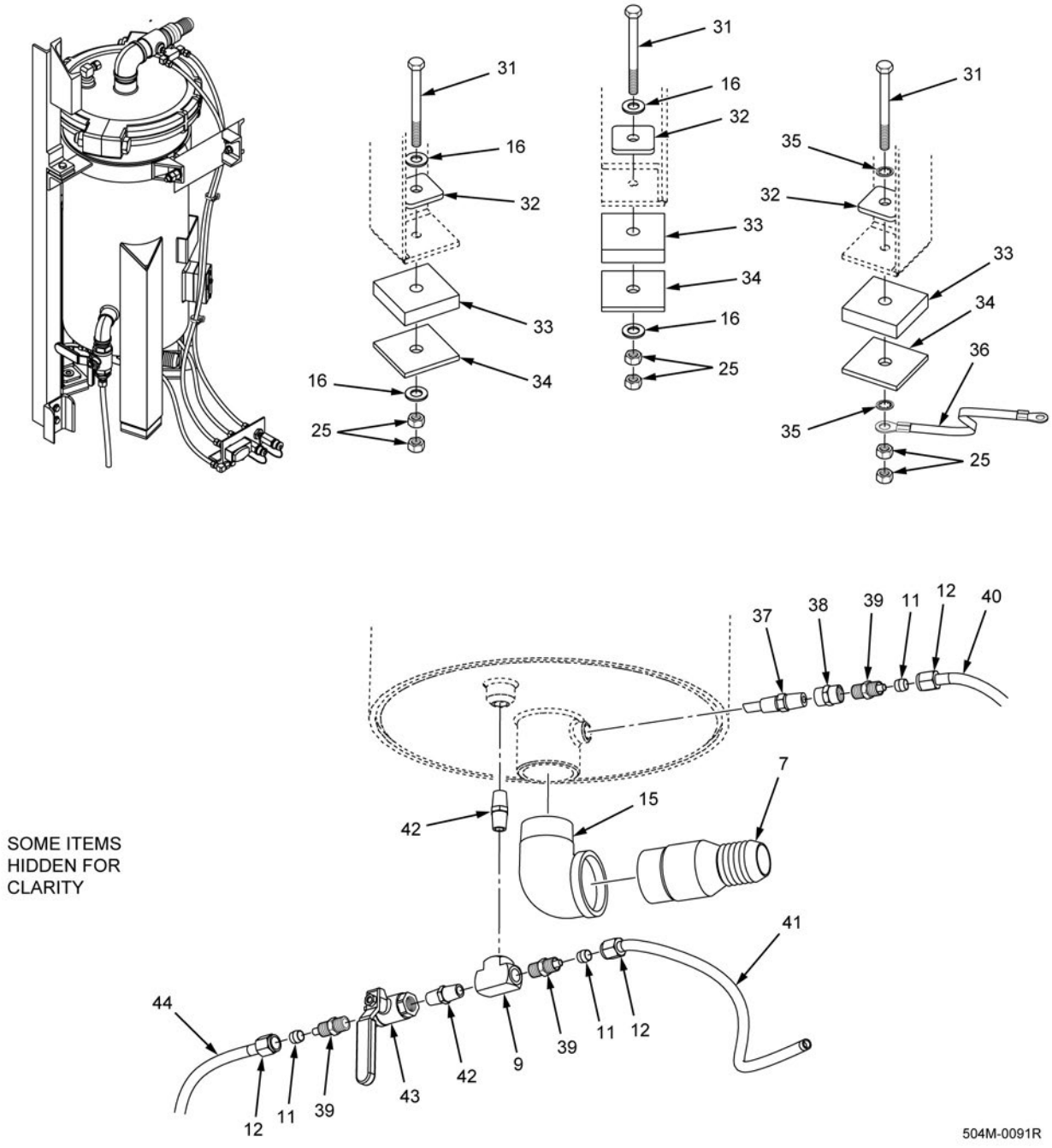


Figure 59. Filter/Separator Assembly (Sheet 2 of 4).

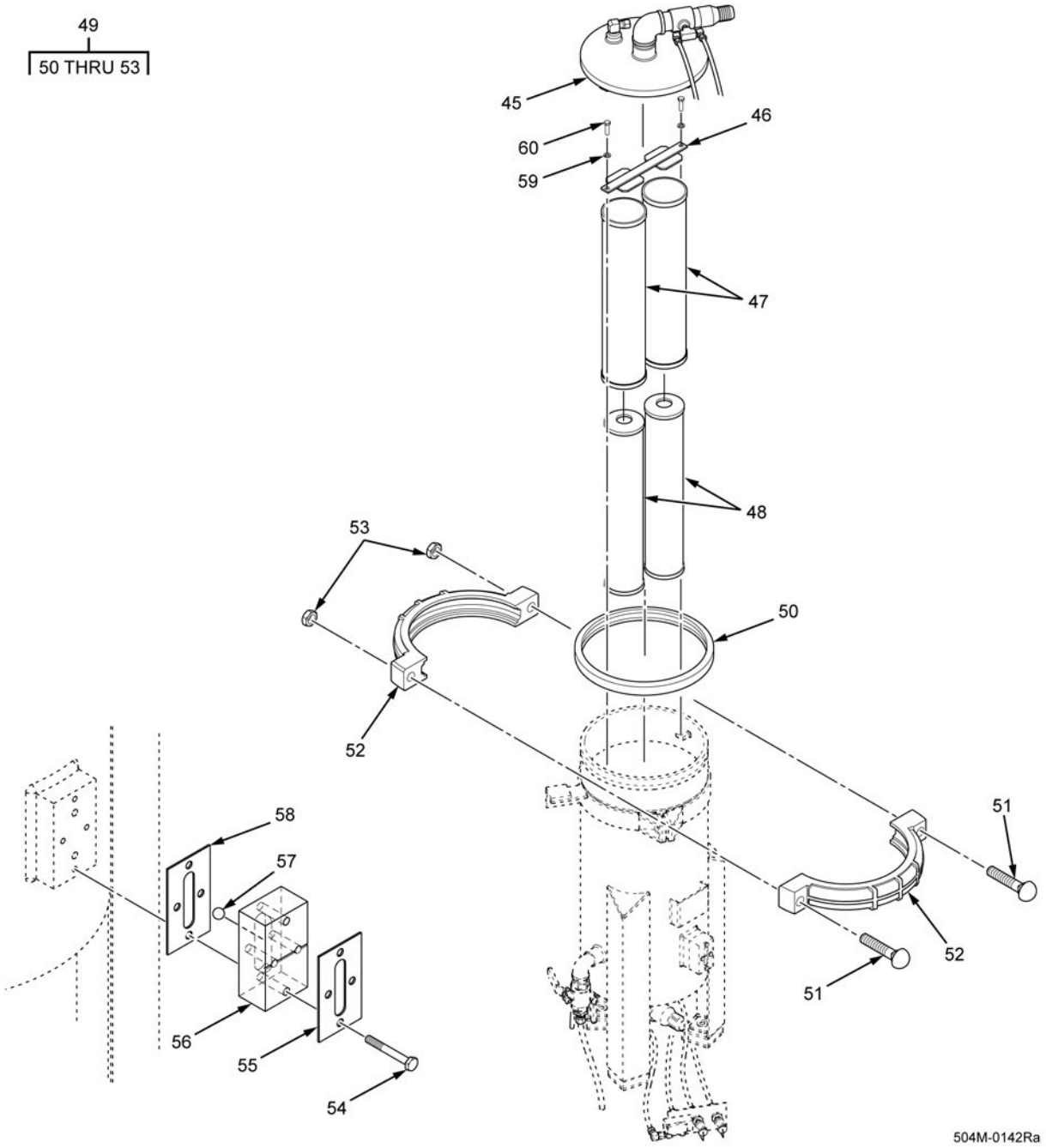


Figure 59. Filter/Separator Assembly (Sheet 3 of 4).

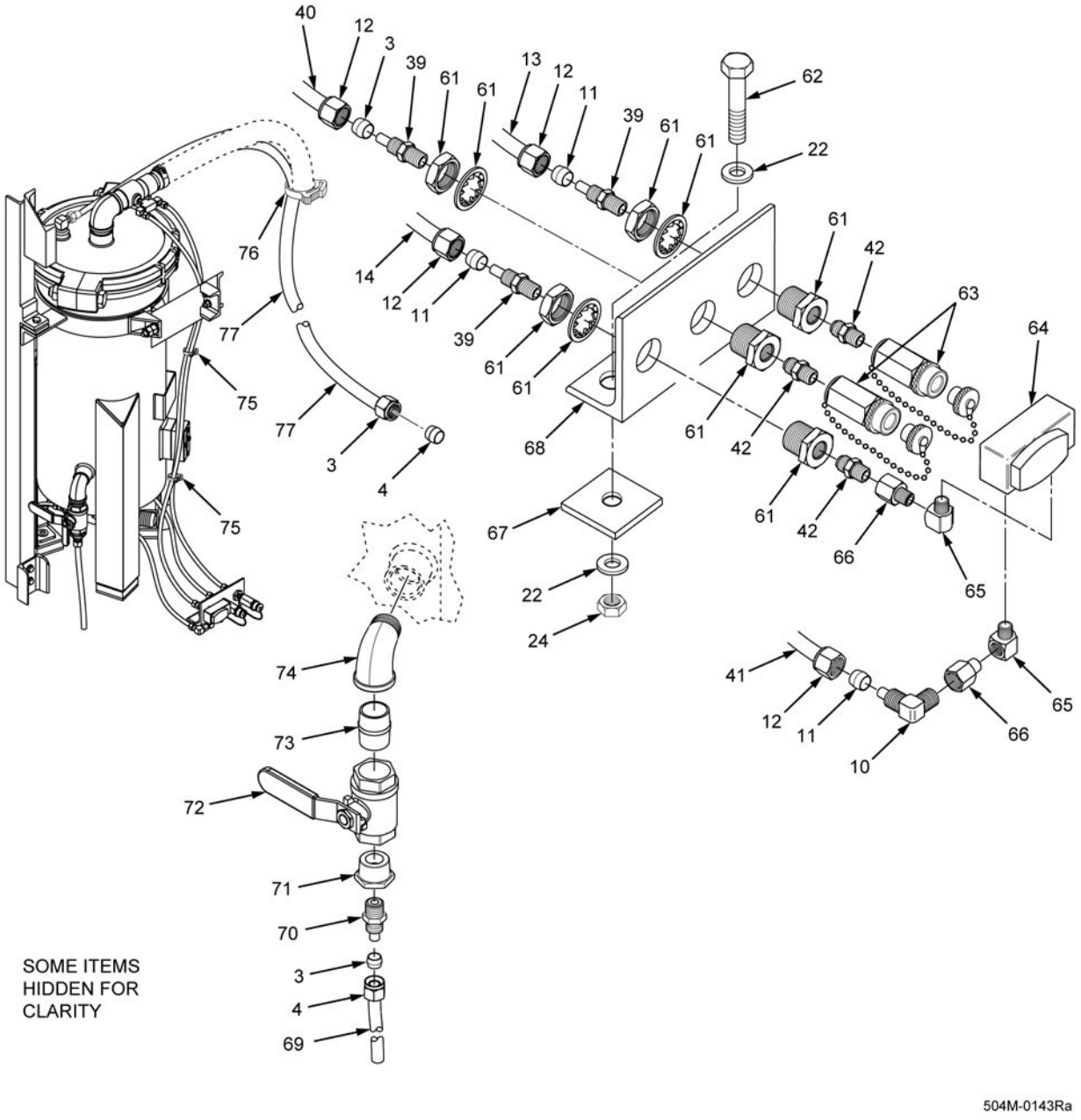


Figure 59. Filter/Separator Assembly (Sheet 4 of 4).

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 1700 FILTER/SEPARATOR ASSEMBLY	
					FIG. 59. FILTER/SEPARATOR ASSEMBLY.	
1	PAFFF	4930-01-662-6387	55242	1060	FILTER/SEPARATOR ASSEMBLY	1
* 2	PAFZZ	4730-01-115-6643	0U583	SAE J246 100202BA	. ELBOW	1
* 3	PAFZZ	4730-01-049-1559	0U583	SAE J246 8 100115B	. SLEEVE,COMPRESSION,TUBE-HOSE FITTING (FERRULE)	3
* 4	PAFZZ	4730-01-048-7874	0U583	SAE J246 8 100110B	. TUBE NUT	3
* 5	PAFZZ	4730-01-506-4403	39428	4568K261	. NIPPLE,PIPE	1
6	PAFZZ	4730-01-662-5699	55242	1060-04	. COUPLING	1
* 7	PAFZZ	4730-01-244-4664	72661	RST20	. FITTING,HOSE 1-1/2"	2
8	PAFZZ	6665-01-662-2417	55242	1060-01-11	. SAMPLING PROBE, OUTLET	1
* 9	PAFZZ	4730-01-235-3007	0U583	SAE J530 8-8-8 140439B	. TEE,BRASS	2
* 10	PAFZZ	4730-00-069-1187	81343	SAE J246 6-4 100202BA	. ELBOW, MALE, BRASS	3
11	PAFZZ	4730-01-048-5260	81343	SAE J246 6 100115B	. FERRULE	9
* 12	PAFZZ	4730-01-148-7873	0U583	SAE J246 6 100110B	. TUBE NUT	9
13	PCFZZ	4710-01-662-4925	55242	1060-03-05	. DISCHARGE SAMPLING PORT LINE	1
14	PCFZZ	4710-01-662-6922	55242	1060-03-03	. DISCHARGE DIFFERENTIAL GAUGE LINE	1
* 15	PAFZZ	4730-01-667-8850	0U583	24-24 141439FB	. ELBOW,PIPE	2
* 16	PAFZZ	5310-01-665-0387	05047	AEW24X50N000SB8 A31	. WASHER, FLAT	10
* 17	PAFZZ	5306-01-664-9310	05047	AEB02C500A50CH2 A31	. BOLT,MACHINE HEXAGON HEAD	1
18	PAFZZ	5340-01-662-7948	55242	1060-02	. FILTER/SEPARATOR RING CLAMP	1
* 19	PAFZZ	5306-01-665-3048	05047	AEB02C500B50CH2 A31	. BOLT,MACHINE HEXAGON HEAD	2
20	PCFZZ	5340-01-663-3278	55242	1060-01-09	. BRACKET DAMPENING P	3
* 21	PAFZZ	5305-01-665-1734	05047	AEB02C375A25CH2 A31	. SCREW,CAP,HEXAGON HEAD	2
* 22	PAFZZ	5310-01-665-0457	05047	AEW24X37N000SB8 A31	. WASHER, FLAT	14
23	PAFZZ	5340-01-663-3285	55242	1051C-01-89	. BRACKET,FILTER	1
* 24	PAFZZ	5310-01-475-9244	39428	91831A127	. NUT,SELF-LOCKING,HEXAGON	3

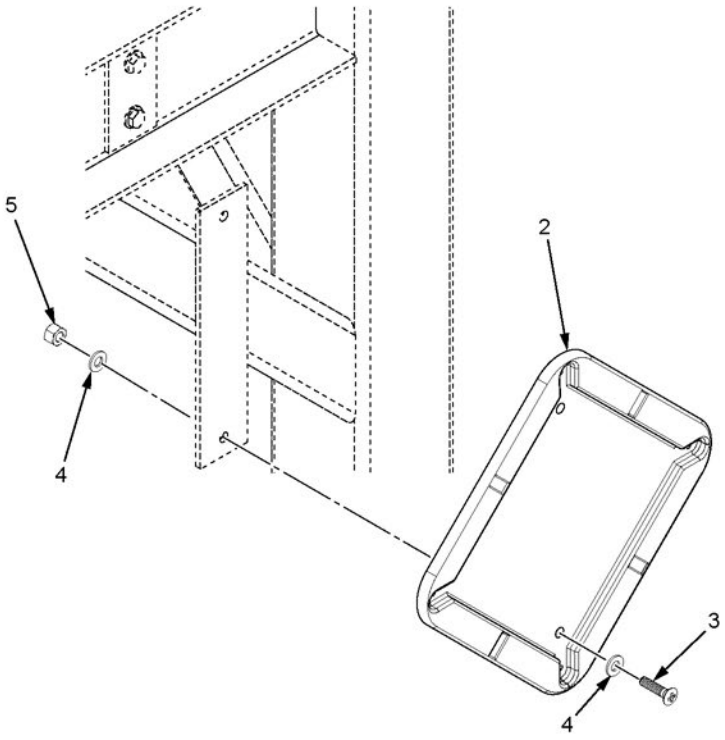
(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
* 25	PAFZZ	5310-01-665-3139	05047	AEN04C500000SB8 A31	. NUT, PLAIN, HEXAGON	10
* 26	PAFZZ	5310-01-665-3067	05047	AEN04C375000SB8 A31	. NUT, PLAIN, HEXAGON	8
* 27	PAFZZ	5306-01-665-1752	05047	AEB02C375A50CH2 A31	. SCREW,CAP,HEXAGON HEAD	4
28	PAFZZ	5340-01-663-0037	55242	1051C-01-102	. BRACKET,ANGLE	1
* 29	PAFZZ	5310-01-475-9155	39428	91831A137	. NUT,SELF-LOCKING,HEXAGON	1
30	PAFZZ	4930-01-662-7593	55242	1060-01	. FILTER/SEPARATOR WELDMENT	1
* 31	PAFZZ	5305-01-665-1756	05047	AEB02C500D50CH2 A31	. SCREW,CAP,HEXAGON HEAD	3
32	PAFZZ	5340-01-663-3280	55242	1060-01-12	. WASHER,BRACKET	3
33	PCFZZ	2590-01-662-3003	55242	1060-01-07	. DAMPING PAD	3
34	PAFZZ	5340-01-663-3281	55242	1060-01-08	. PLATE,METAL, MOUNTING	3
* 35	PAFZZ	5310-01-665-0648	05047	AEW11X500000SB8 A31	. WASHER,LOCK,INTERNAL TOOTH	2
36	PAFZZ	5999-01-662-2471	55242	1051G-11	. STRIP,GROUNDING	1
37	PAFZZ	6665-01-662-1523	55242	1060-01-10	. SAMPLING PROBE	1
38	PAFZZ	4730-00-277-5736	81343	SAE J530 4-4 130138B	. FEMALE COUPLING,HEX	1
* 39	PAFZZ	4730-01-062-2570	81343	SAE J246 6-4 100102BA	. ADAPTER,STRAIGHT,PIPE TO TUBE	6
* 40	PCFZZ	4710-01-662-6917	55242	1060-03-04	. TUBING,NONMETALLIC (INLET SAMPLING LINE)	1
41	PCFZZ	4710-01-662-6912	55242	1060-03-02	. LINE,INLET DIFFERENTIAL GAUGE	1
42	PAFZZ	4730-00-277-8289	93061	216P-4	. NIPPLE	5
* 43	PAFZZ	4820-01-665-4306	82666	T-255-FB-P 1/4	. VALVE, BALL, 1/4	1
44	PCFZZ	4710-01-662-4588	55242	1060-03-01	. FUEL DRAIN LINE	1
45	PAFZZ	4930-01-662-7217	55242	ISO-783-02	. LID,FILTER/SEPARATOR	1
46	PAFZZ	5340-01-662-7480	55242	ISO-783-07	. SPIDER WELDMENT ASSEMBLY	1
47	PAFZZ	4330-00-062-3836	87405	640269	. FILTER ELEMENT,FLUID	2
48	PCFZZ	4330-01-662-2127	56NK5	MC-320002	. FILTER ELEMENT, FLUID	2
49	PAFZZ	5340-01-662-6377	55242	1060-10	. ASSEMBLY,FILTER/SEPARATOR CLAMP	1
50	XAFZZ		06LW3	65GCPN120	. . GASKET	1
51	XAFZZ		06LW3	65NB010060	. . BOLT	2
* 52	PAFZZ	4730-01-665-4063	06LW3	65SF3120	. . COUPLING	2
53	XAFZZ		06LW3	65NB010060	. . BOLT HEX	2
* 54	PAFZZ	5305-01-605-3996	39428	92198A550	. SCREW,CAP,HEXAGON HEAD	4

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
55	PAFZZ	6680-01-662-1677	55242	ISO-531-04	. GAUGE GUARD	1
* 56	PAFZZ	6680-01-663-9706	55242	1060-01-13	. INDICATOR,SIGHT,LIQUID	1
57	PAFZZ	6680-01-662-2780	55242	ISO-531-05	. BALL,FUEL LEVEL FLOAT	1
58	PCFZZ	5330-01-664-0468	55242	ISO-531-02	. GASKET,GAUGE	1
* 59	PAFZZ	5310-01-665-7753	05047	AEW07X375000SB8 A31	. WASHER, LOCK	2
* 60	PAFZZ	5306-01-665-1752	05047	AEB02C375A50CH2 A31	. SCREW,CAP,	2
61	PAFZZ	4730-01-164-3365	97403	13229E0849	. COUPLING,BULKHEAD	3
* 62	PAFZZ	5306-01-665-3454	05047	AEB02C375B50CH2 A31	. BOLT,MACHINE HEXAGON HEAD	1
63	PAFZZ	6695-01-662-2793	55242	1060-06	. FUEL SAMPLER	2
* 64	PAFZZ	6685-01-662-2788	55242	1060-14	. GAGE,DIFFERENTIAL,DIAL INDICATING	1
* 65	PAFZZ	4730-00-639-9730	81343	SAE J530 2-2 130239B	. ELBOW, BRASS	2
66	PAFZZ	4730-00-652-6531	81343	SAE J514 2-4 140139B	. ADAPTER, REDUCING	2
67	PAFZZ	5340-01-663-6303	55242	1051C-01-88	. GRATING CLASP	1
68	PAFZZ	5340-01-663-0033	55242	1051C-01-95	. BRACKET,SAMPLING PORT	1
69	PCFZZ	4720-01-662-2551	5F955	1060-03-06	. LINE,WATER DRAIN	1
70	PAFZZ	4730-01-134-7759	81343	SAE J246 8-8 100102BA	. CONNECTOR	1
71	PAFZZ	4730-01-642-2901	93061	209P-16-8	. BUSHING,BRASS	1
* 72	PAFZZ	4820-01-665-3799	82666	T-255-FB-P 1	. BALL VALVE	1
73	PAFZZ	4730-01-481-4976	39428	4568K221	. NIPPLE,CLOSE	1
74	PAFZZ	4730-01-334-4297	39428	4429K155	. STREET ELBOW, BRASS	1
75	PAFZZ	4730-99-371-9140	77ZT1	HC-G-PA66-BK	. DOUBLE SNAP, GRIP CLIP	2
76	PAFZZ	4730-01-663-2251	77ZT1	HC-59-PA66-BK	. DOUBLE SNAP, GRIP CLIP	1
77	PCFZZ	4710-01-662-6862	55242	1051F-21-06	. AIR ELIMINATOR LINE	1

END OF FIGURE

MAINTAINER
ISO RACK PLACARDS

1
2 THRU 5



TRMM-0018R

Figure 60. ISO Rack Placards.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 1800 ISO RACK PLACARDS	
					FIG. 60. ISO RACK PLACARDS.	
1	XCFZZ		55242	1051D-10	ISO RACK PLACARD ASSEMBLY.....	1
2	PAFZZ	4710-01-662-7247	55242	1051D-10-01	. ISO RACK PLACARD.....	1
* 3	PAFZZ	5305-01-665-7782	05047	AESF5C250750CH2A31	. SCREW, MACHINE.....	2
* 4	PAFZZ	5310-01-665-0396	05047	AEW24X25N000SB8A31	. WASHER, FLAT.....	4
* 5	PAFZZ	5310-01-416-1851	39428	91831A029	. NUT,SELF-LOCKING, HEXAGON.....	2
					END OF FIGURE	

MAINTAINER
DATA PLATES

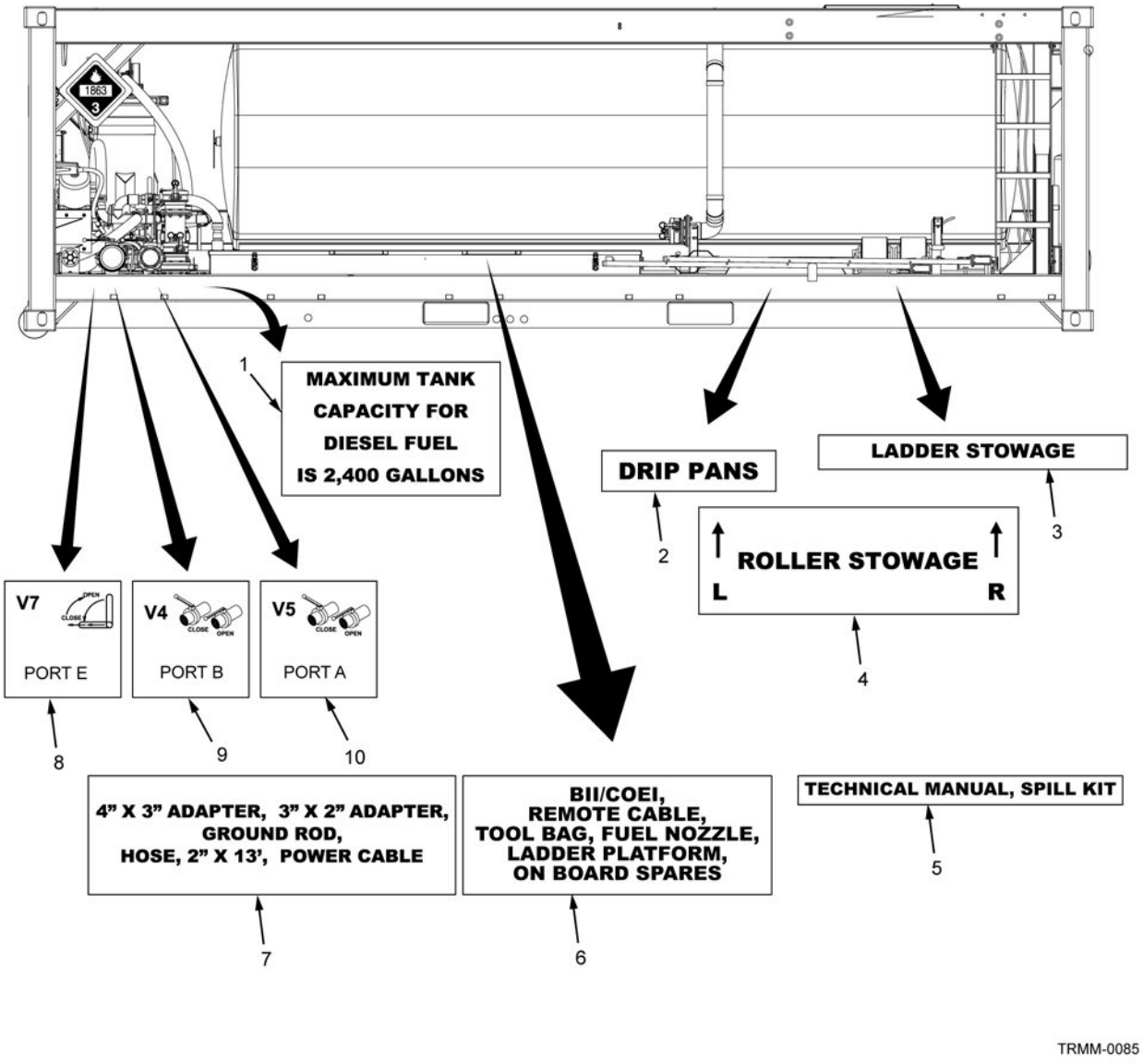


Figure 61. Data Plates (Sheet 1 of 9).

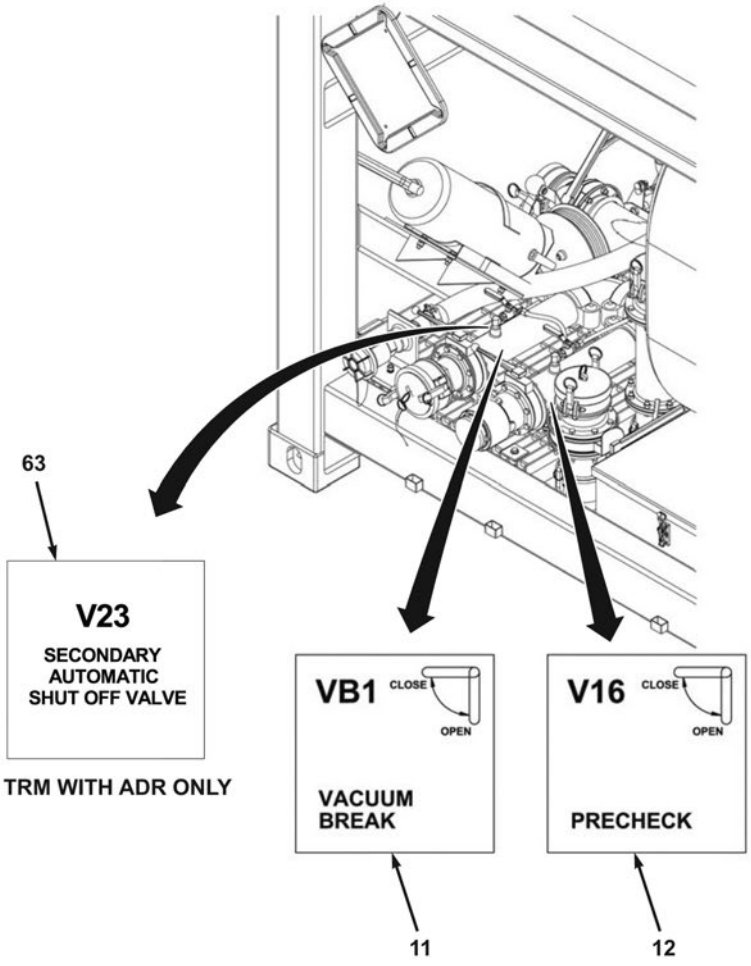


Figure 61. Data Plates (Sheet 2 of 9).

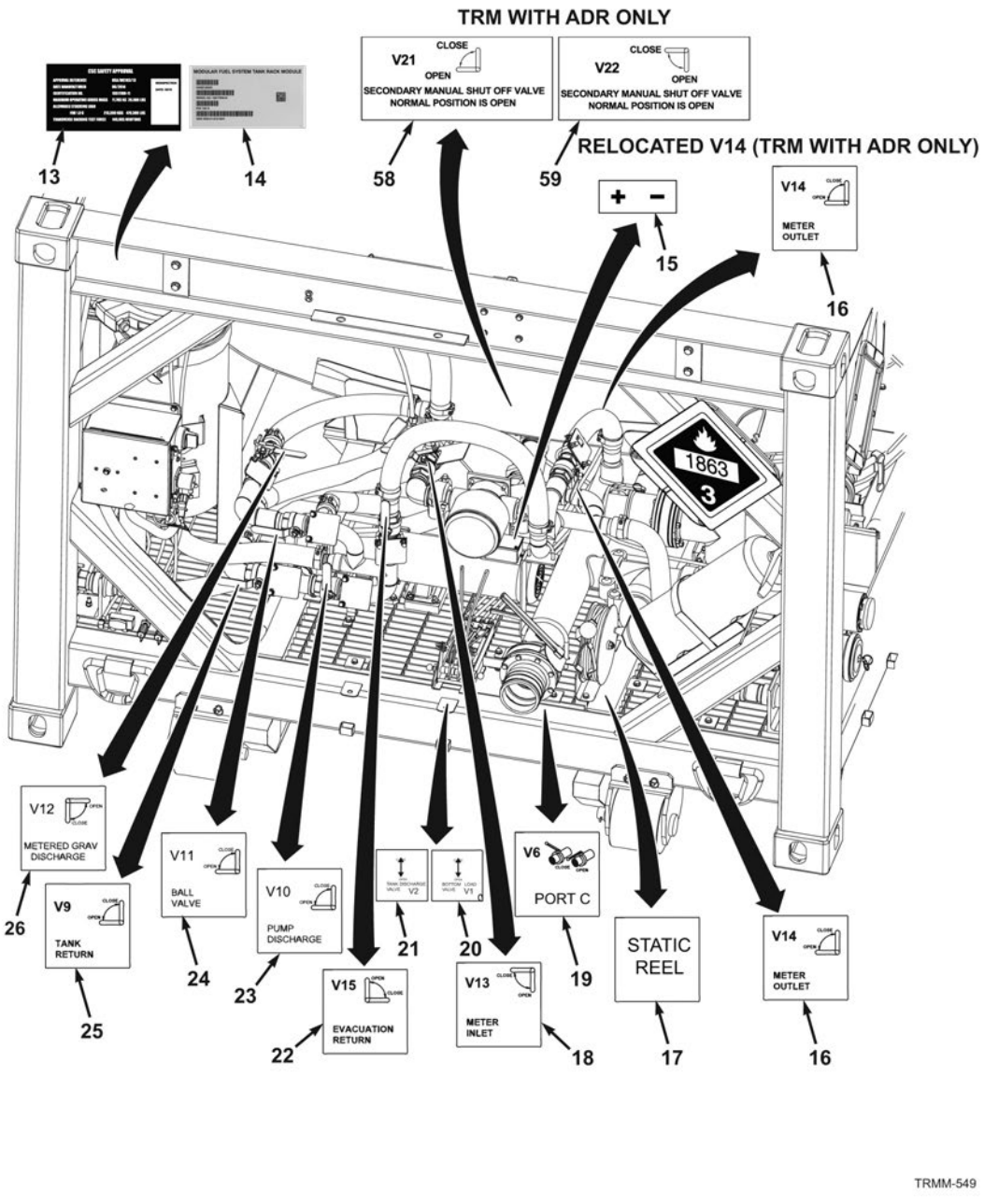


Figure 61. Data Plates (Sheet 3 of 9).

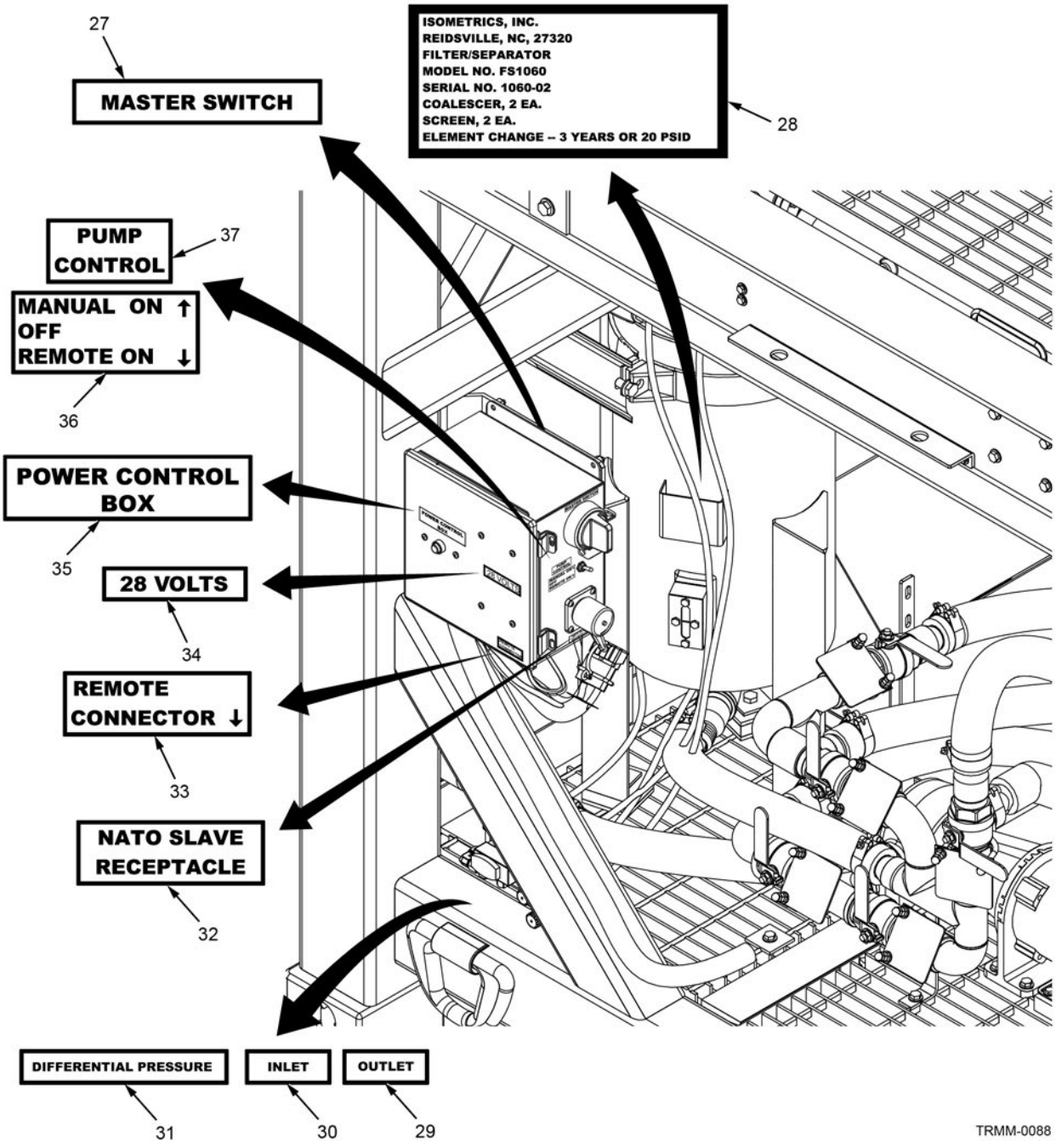


Figure 61. Data Plates (Sheet 4 of 9).

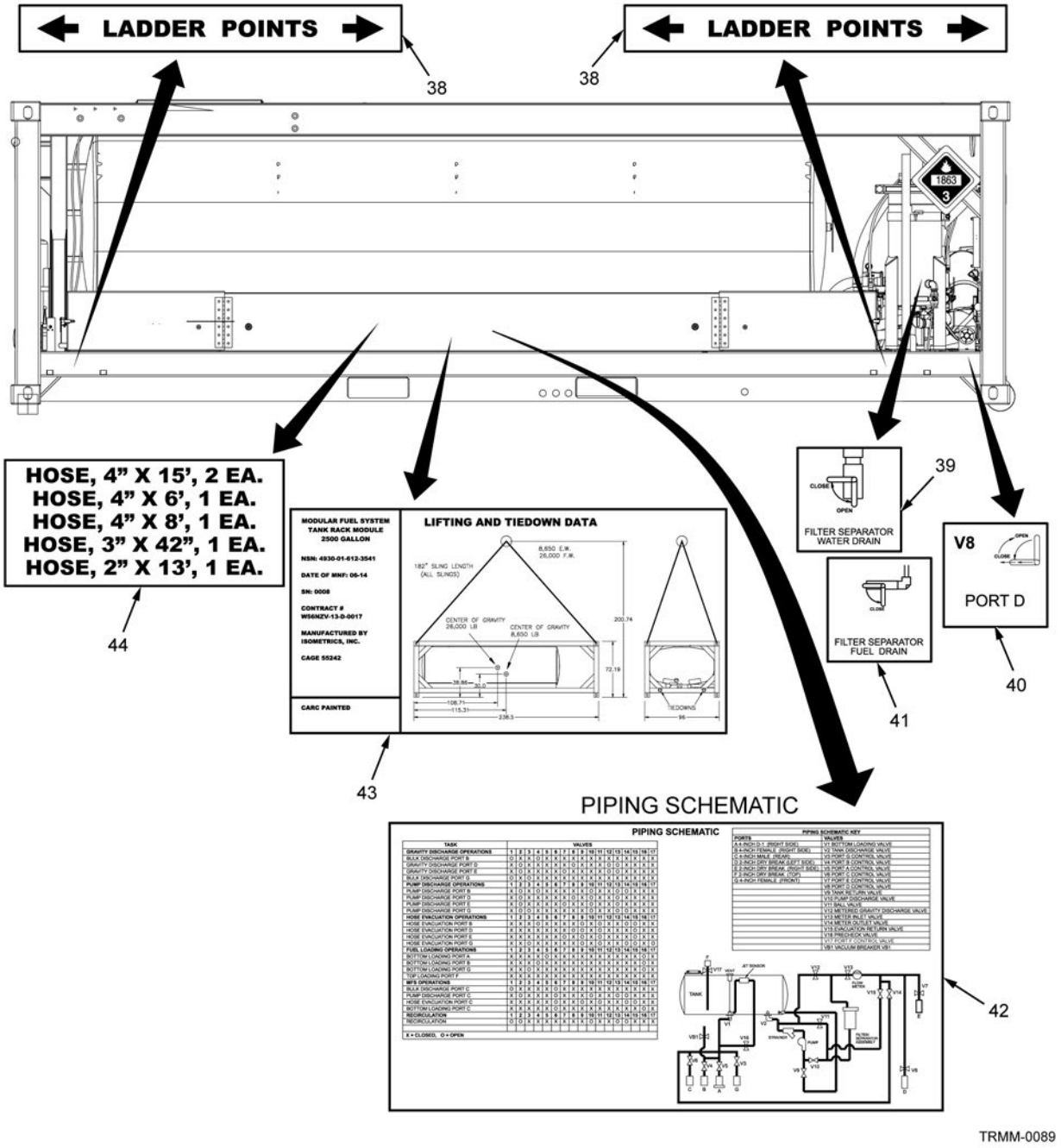


Figure 61. Data Plates (Sheet 5 of 9).

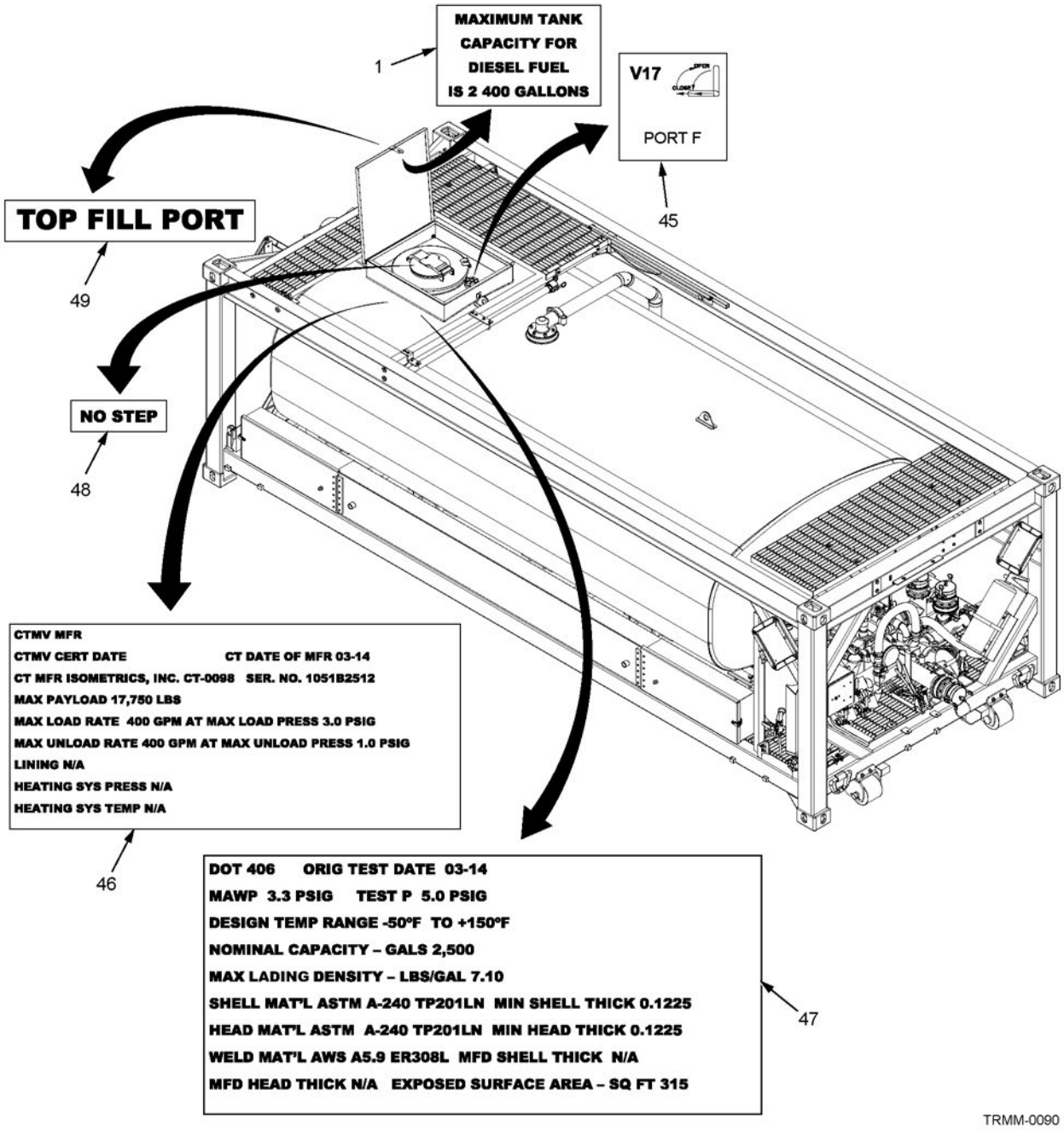

MAXIMUM TANK CAPACITY FOR DIESEL FUEL IS 2 400 GALLONS
1
V17
PORT F
45
TOP FILL PORT
49
NO STEP
48
CTMV MFR
CTMV CERT DATE CT DATE OF MFR 03-14
CT MFR ISOMETRICS, INC. CT-0098 SER. NO. 1051B2512
MAX PAYLOAD 17,750 LBS
MAX LOAD RATE 400 GPM AT MAX LOAD PRESS 3.0 PSIG
MAX UNLOAD RATE 400 GPM AT MAX UNLOAD PRESS 1.0 PSIG
LINING N/A
HEATING SYS PRESS N/A
HEATING SYS TEMP N/A
46
DOT 406 ORIG TEST DATE 03-14
MAWP 3.3 PSIG TEST P 5.0 PSIG
DESIGN TEMP RANGE -50°F TO +150°F
NOMINAL CAPACITY – GALS 2,500
MAX LADING DENSITY – LBS/GAL 7.10
SHELL MAT'L ASTM A-240 TP201LN MIN SHELL THICK 0.1225
HEAD MAT'L ASTM A-240 TP201LN MIN HEAD THICK 0.1225
WELD MAT'L AWS A5.9 ER308L MFD SHELL THICK N/A
MFD HEAD THICK N/A EXPOSED SURFACE AREA – SQ FT 315
47
TRMM-0090

Figure 61. Data Plates (Sheet 6 of 9).

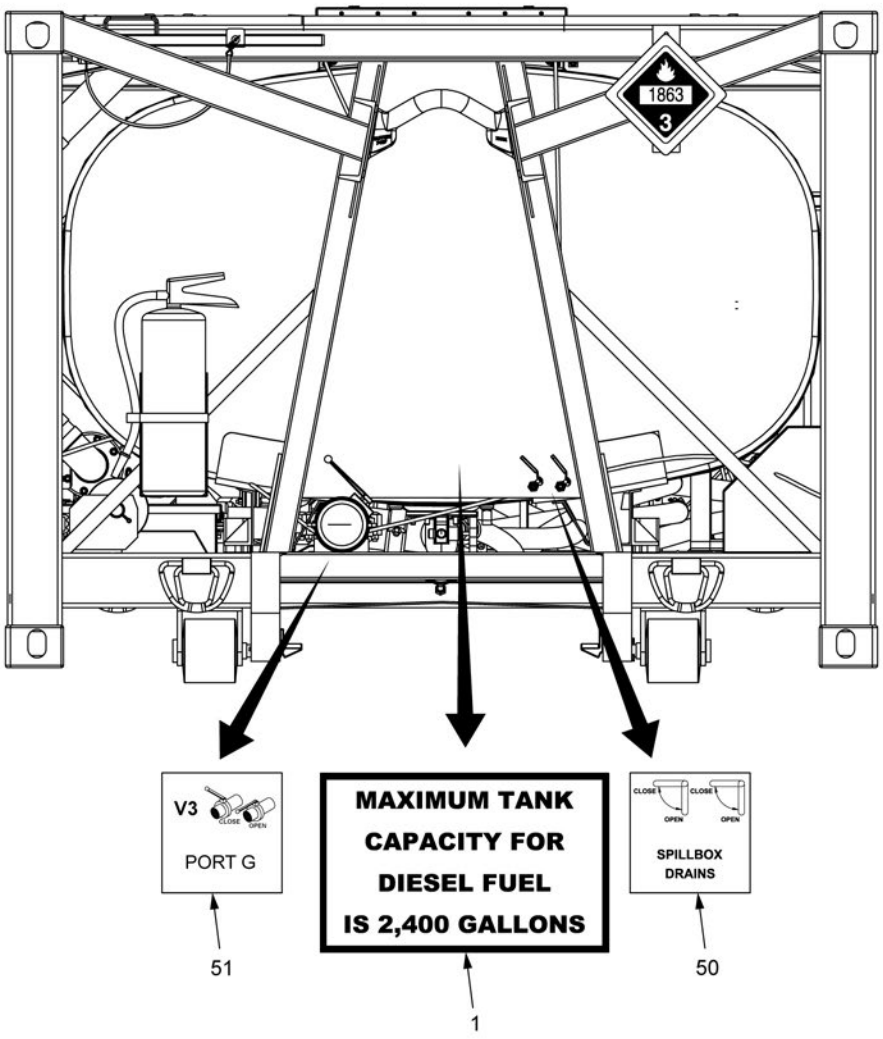


Figure 61. Data Plates (Sheet 7 of 9).

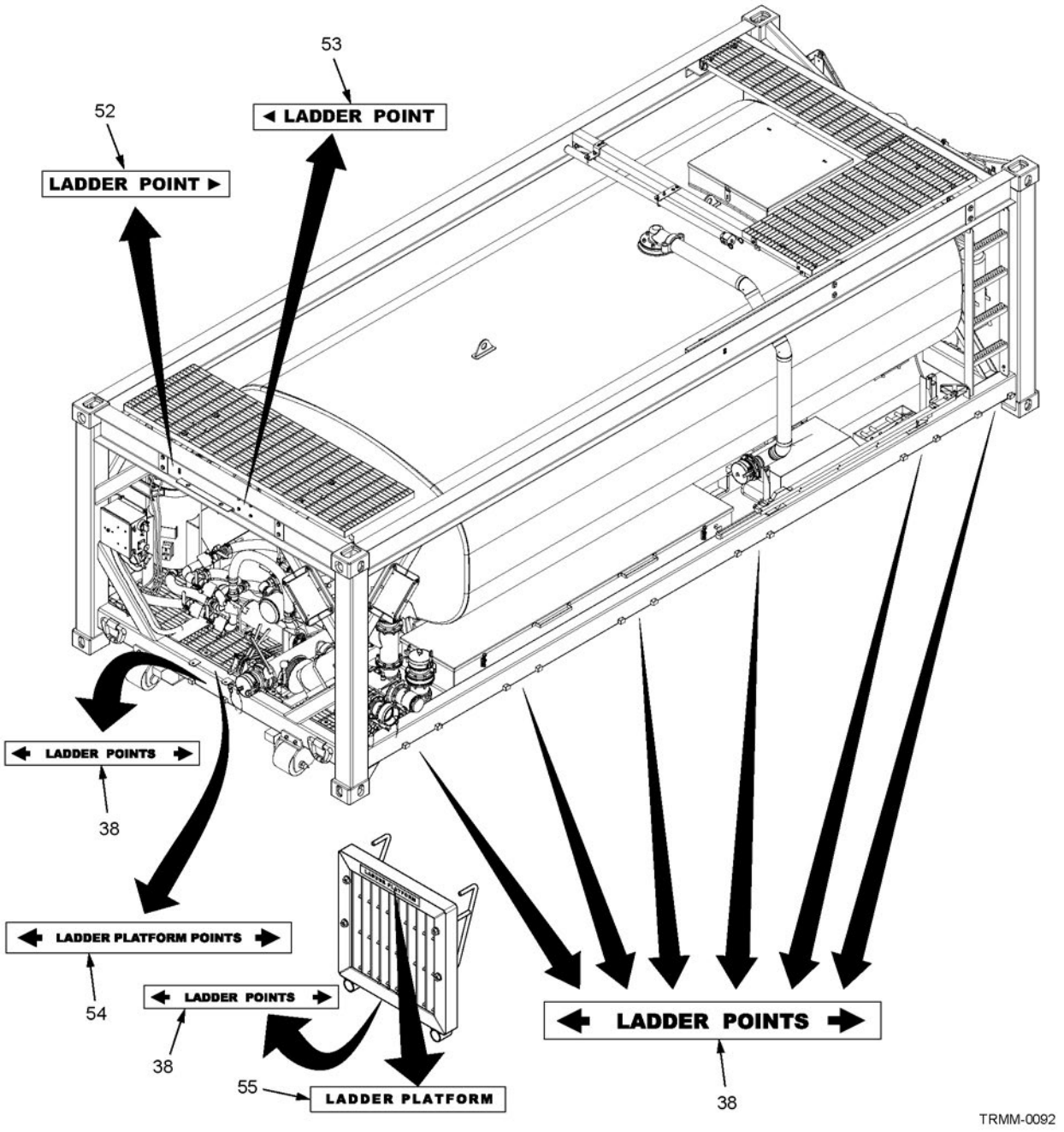


Figure 61. Data Plates (Sheet 8 of 9).

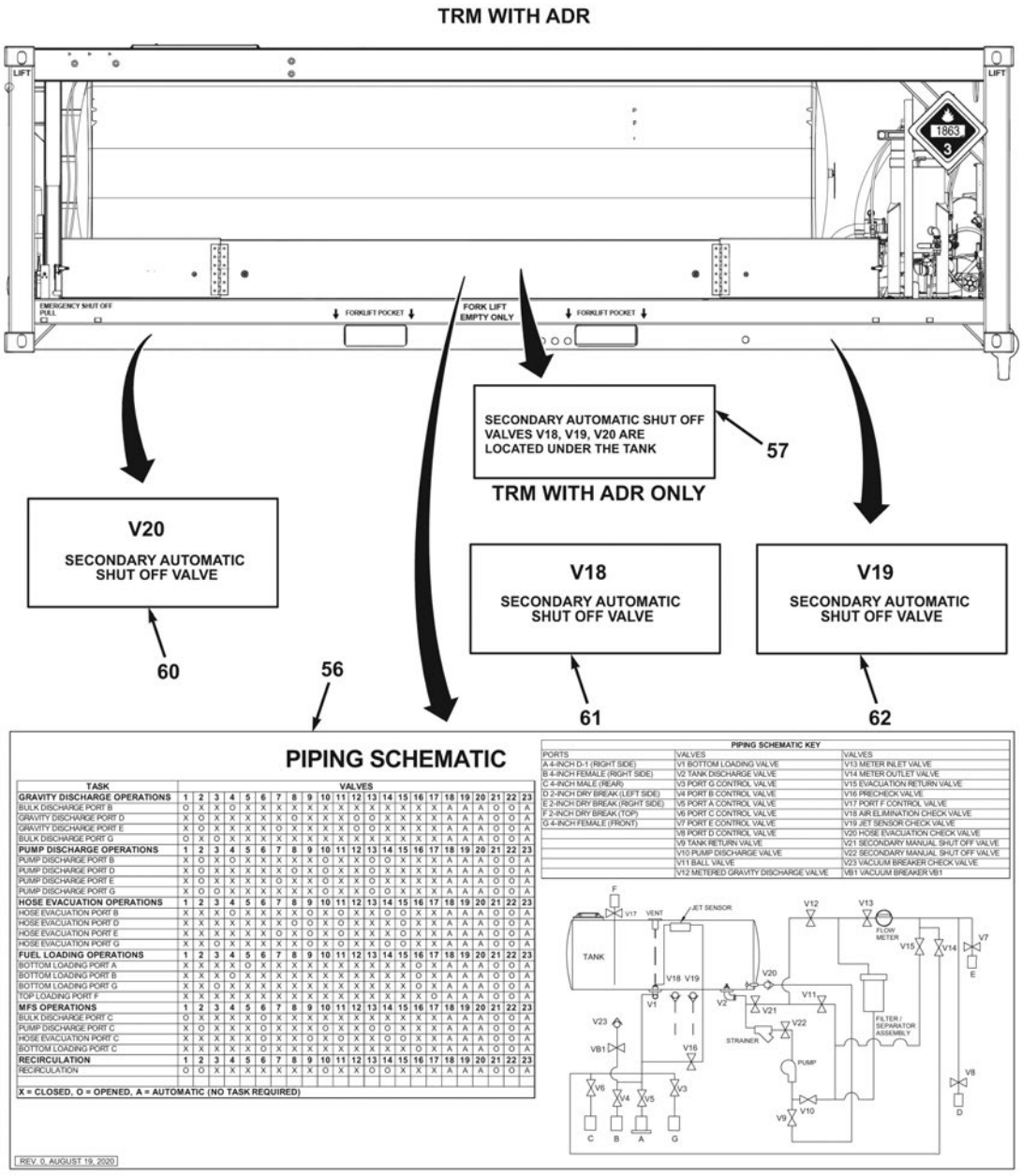


Figure 61. Data Plates (Sheet 9 of 9).

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 1900 DATA PLATES	
					FIG. 61. DATA PLATES.	
1	PAFZZ	7690-01-663-3198	55242	1051D-01-10	MARKER,IDENTIFICATION (MAX TANK CAPACITY L)	3
2	PAFZZ	7690-01-663-2978	55242	1051D-01-16	MARKER,IDENTIFICATION (DRIP PANS LABEL)	1
3	PAFZZ	2590-01-663-3968	55242	1051D-03-07	MARKER,IDENTIFICATION (LADDER STOWAGE)	1
4	PAFZZ	7690-01-663-3228	55242	1051D-01-12	MARKER,IDENTIFICATION (ROLLER STOWAGE LABEL)	1
5	PAFZZ	7690-01-663-1473	55242	1051D-01-09	MARKER,IDENTIFICATION (BII BOX LABEL 3)	1
6	PAFZZ	7690-01-663-1425	55242	1051D-01-07	MARKER,IDENTIFICATION (BII BOX LABEL 1)	1
7	PAFZZ	7690-01-663-1448	55242	1051D-01-08	MARKER,IDENTIFICATION (BII BOX LABEL 2)	1
8	PAFZZ	4820-01-662-3089	55242	1051D-04-07	MARKER,IDENTIFICATION (V7 PORT E)	1
9	PAFZZ	4820-01-662-3083	55242	1051D-04-04	MARKER,IDENTIFICATION (V4 PORT B)	1
* 10	PAFZZ	7690-01-662-3077	55242	1051D-04-05	MARKER,IDENTIFICATION (V5 PORT A)	1
11	PAFZZ	5930-01-662-5100	55242	1051D-04-17	MARKER,IDENTIFICATION (VB1 VACUUM BREAK)	1
* 12	PAFZZ	7690-01-662-2810	55242	1051D-04-16	MARKER,IDENTIFICATION (V16 PRECHECK)	1
13	PAFZZ	7690-01-663-3218	55242	1051D-01-03	MARKER,IDENTIFICATION (CSC DATA PLATE)	1
14	PAFZZ	2590-01-663-3332	55242	1051D-01-04	MARKER,IDENTIFICATION (IUID PLATE)	1
15	PAFZZ	7690-01-663-2048	55242	1051D-02-05	MARKER,IDENTIFICATION (PLUS MINUS LABEL)	1
16	PAFZZ	7690-01-662-4384	55242	1051D-04-14	MARKER,IDENTIFICATION (V14 METER OUTLET)	1
17	PAFZZ	7690-01-663-1783	55242	1051D-04-18	MARKER,IDENTIFICATION (STATIC REEL)	1
18	PAFZZ	4820-01-662-6572	55242	1051D-04-13	MARKER,IDENTIFICATION (V13 METER INLET)	1
19	PAFZZ	4820-01-662-2555	55242	1051D-04-06	MARKER,IDENTIFICATION (V6 PORT C)	1
20	PAFZZ	4820-01-662-3092	55242	1051D-04-01	MARKER,IDENTIFICATION (V1 BOTTOM LOAD VALVE)	1
* 21	PAFZZ	7690-01-662-1880	55242	1051D-04-02	MARKER,IDENTIFICATION (V2 TANK DISCHARGE VALVE)	1

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
* 22	PAFZZ	7690-01-662-2413	55242	1051D-04-15	MARKER,IDENTIFICATION (V15 METER OUTLET)	1
23	PAFZZ	4820-01-662-4558	55242	1051D-04-10	MARKER,IDENTIFICATION (V10 PUMP DISCHARGE)	1
24	PAFZZ	4820-01-662-4989	55242	1051D-04-11	MARKER,IDENTIFICATION (V11 BALL VALVE)	1
25	PAFZZ	7690-01-662-4329	55242	1051D-04-09	MARKER,IDENTIFICATION (V9 TANK RETURN)	1
* 26	PAFZZ	7690-01-662-2421	55242	1051D-04-12	MARKER,IDENTIFICATION (V12 METERED GRAVITY)	1
27	PAFZZ	7690-01-663-3212	55242	1051D-02-03	MARKER,IDENTIFICATION (MASTER SWITCH LABEL)	1
28	PAFZZ	7690-01-663-1670	55242	1051D-05-01	MARKER,IDENTIFICATION (F/S ELEMENTS)	1
29	PAFZZ	7690-01-663-1502	55242	1051D-05-05	MARKER,IDENTIFICATION (OUTLET)	1
30	PAFZZ	7690-01-663-1600	55242	1051D-05-04	MARKER,IDENTIFICATION (INLET)	1
31	PAFZZ	7690-01-663-0444	55242	1051D-05-03	MARKER,IDENTIFICATION (DIFFERENTIAL PRESSURE GAUGE)	1
* 32	PAFZZ	7690-01-662-6396	55242	1051D-02-04	MARKER,IDENTIFICATION (NATO SLAVE RECEPTACLE)	1
33	PAFZZ	7690-01-663-3231	55242	1051D-02-02	MARKER,IDENTIFICATION (REMOTE CONNECTOR LA)	1
34	PAFZZ	7690-01-663-1959	55242	1051D-02-06	MARKER,IDENTIFICATION (28 VOLTS LABEL)	1
35	PAFZZ	7690-01-663-3186	55242	1051D-02-01	MARKER,IDENTIFICATION (POWER CONTROL BOX L)	1
36	PAFZZ	7690-01-663-3191	55242	1051D-02-07	MARKER,IDENTIFICATION (MANUAL SWITCH LABEL)	1
37	PAFZZ	7690-01-663-1994	55242	1051D-02-08	MARKER,IDENTIFICATION (PUMP CONTROL LABEL)	1
* 38	PAFZZ	2590-01-662-0765	55242	1051D-01-15	MARKER,IDENTIFICATION (LADDER POINTS LABEL)	10
39	PAFZZ	7690-01-663-1717	55242	1051D-05-02	MARKER,IDENTIFICATION (MARKER, IDENTIFICATION)	1
* 40	PAFZZ	7690-01-662-3707	55242	1051D-04-08	MARKER,IDENTIFICATION (V8 PORT D)	1
41	PAFZZ	7690-01-663-0663	55242	1051D-05-06	MARKER,IDENTIFICATION(F/S FUEL DRAIN)	1
42	PAFZZ	7690-01-663-6638	55242	1051D-01-06	MARKER,IDENTIFICATION (VALVE OPERATION SCH)	1
43	PAFZZ	7690-01-663-4812	55242	1051D-01-05	MARKER,IDENTIFICATION (LIFT AND TIEDOWN DA)	1
44	PAFZZ	7690-01-663-3203	55242	1051D-01-11	MARKER,IDENTIFICATION (HOSE BOX CONTENTS)	1

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
45	PAFZZ	7690-01-663-3225	55242	1051D-03-03	MARKER,IDENTIFICATION (V17 PORT F)	1
46	PAFZZ	7690-01-663-2921	55242	1051D-01-02	MARKER,IDENTIFICATION (CTMV LABEL)	1
47	PAFZZ	2590-01-663-3312	55242	1051D-01-01	MARKER,IDENTIFICATION (DOT DATA PLATE)	1
48	PAFZZ	7690-01-663-4996	55242	1051D-03-02	MARKER,IDENTIFICATION (NO STEP)	1
49	PAFZZ	7690-01-663-6644	55242	1051D-03-06	MARKER,IDENTIFICATION (TOP FILL PORT)	1
* 50	PAFZZ	2590-01-662-0764	55242	1051D-03-04	MARKER,IDENTIFICATION (SPILL BOX DRAIN LAB)	1
51	PAFZZ	4820-01-662-2560	55242	1051D-04-03	MARKER,IDENTIFICATION (V3, PORT G)	1
* 52	PAFZZ	2910-01-662-0766	55242	1051D-01-13	MARKER,IDENTIFICATION (LADDER POINT LEFT)	1
* 53	PAFZZ	2590-01-662-1697	55242	1051D-01-14	MARKER,IDENTIFICATION (LADDER POINT RIGHT)	1
* 54	PAFZZ	2590-01-662-0763	55242	1051D-03-09	MARKER,IDENTIFICATION (LADDER PLATFORM POI)	1
* 55	PAFZZ	2590-01-662-1259	55242	1051D-03-08	MARKER,IDENTIFICATION (LADDER PLATFORM)	1
* 56	XDFZZ		55242	1051-2-ECP-003-04-06	MARKER,IDENTIFICATION(SCHEMATIC/VALVE CONFIGURATION MATRIX)	1
* 57	XDFZZ		55242	1051D-04-21	PLATE,DATA (SECONDARY SHUT-OFF VALVES)	1
* 58	XDFZZ		55242	1051D-04-19	PLATE,DATA (V21 SECONDARY SHUT-OFF VALVE)	1
* 59	XDFZZ		55242	1051D-04-22	PLATE,DATA (V22 SECONDARY SHUT-OFF VALVE)	1
* 60	XDFZZ		55242	1051D-04-20	PLATE,DATA (V20 SECONDARY AUTOMATIC SHUT-OFF VALVE)	1
* 61	XDFZZ		55242	1051D-04-23	PLATE,DATA (V18 SECONDARY AUTOMATIC SHUT-OFF VALVE)	1
* 62	XDFZZ		55242	1051D-04-24	PLATE,DATA (V19 SECONDARY AUTOMATIC SHUT-OFF VALVE)	1
* 63	XDFZZ		55242	1051D-04-25	PLATE,DATA (V23 SECONDARY AUTOMATIC SHUT-OFF VALVE)	1

END OF FIGURE

MAINTAINER
STATIC REEL

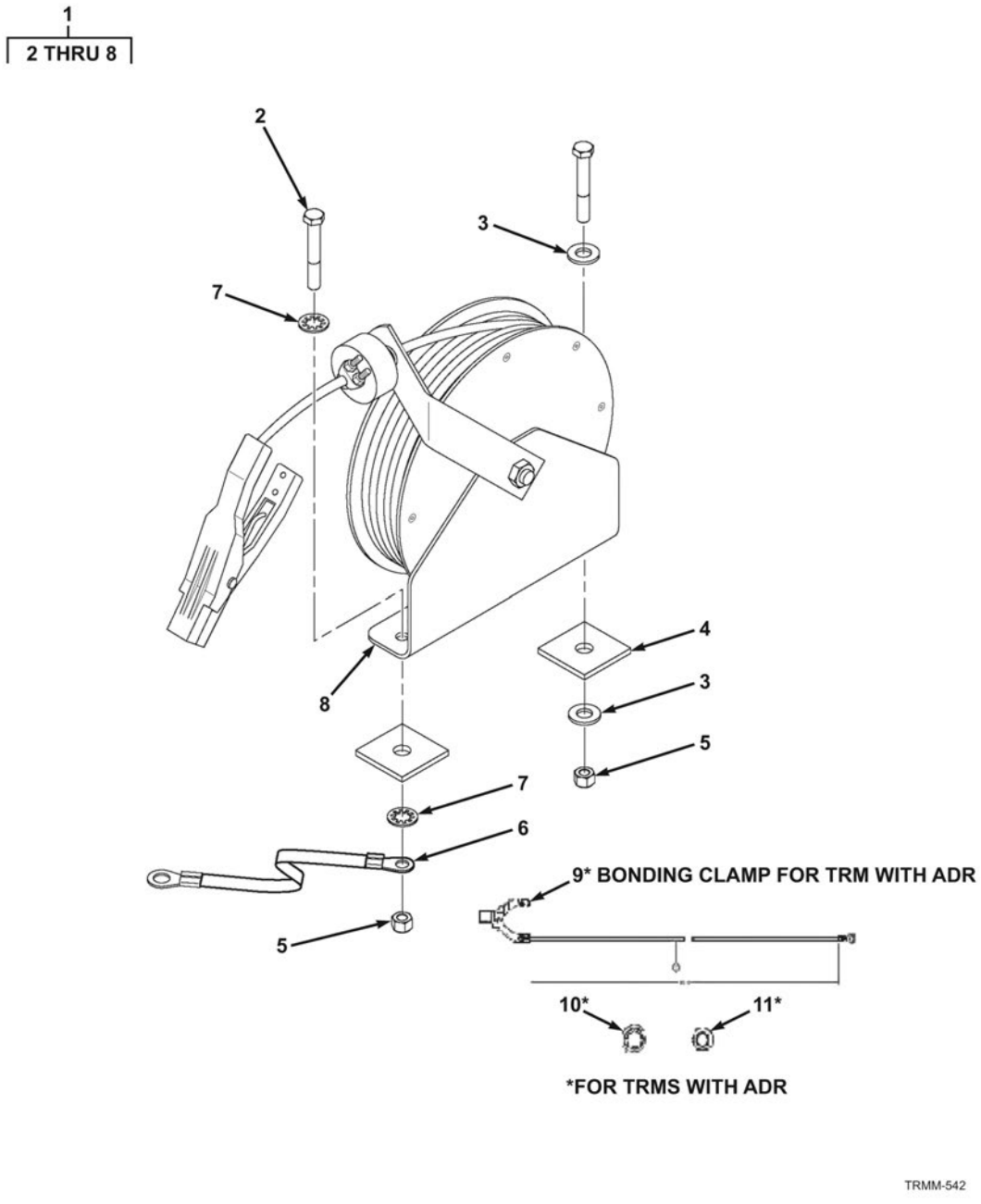


Figure 62. Static Reel.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 2000 STATIC REEL	
					FIG. 62. STATIC REEL.	
1	PAFZZ	4930-01-662-4915	55242	1051A-41	STATIC REEL ASSEMBLY	1
* 2	PAFZZ	5306-01-665-3454	05047	AEB02C375B50CH2A31	. BOLT,MACHINE HEXAGON HEAD	2
* 3	PAFZZ	5310-01-665-0457	05047	AEW24X37N000SB8A31	. WASHER, FLAT	2
4	PAFZZ	5340-01-663-6303	55242	1051C-01-88	. GRATING CLASP	2
* 5	PAFZZ	5310-01-475-9244	39428	91831A127	. NUT,SELF-LOCKING, HEXAGON	2
6	PAFZZ	5999-01-662-2476	55242	1051G-09	. STRAP, GROUNDING	1
* 7	PAFZZ	5310-01-665-0650	05047	AEW11X375000SB8A31	. WASHER,LOCK, INTERNAL TOOTH	2
8	PAFZZ	4930-01-662-4959	55242	1051A-41-01	. STATIC REEL	1
* 9	PAFZZ	5999-01-696-4367	55242	1051-2-ECP-003-01	STRIP,ELECTRICAL GROUNDING (TRM WITH ADR BONDING CLAMP ASSEMBLY)	1
* 10	PAFZZ	5310-01-665-0650	05047	AEW11X375000SB8A31	WASHER,LOCK (TRM WITH ADR)	1
* 11	PAFZZ	5310-01-508-5774	39428	90715A145	NUT,LOCK (TRM WITH ADR)	1
					END OF FIGURE	

MAINTAINER
FIRE EXTINGUISHER BRACKETS

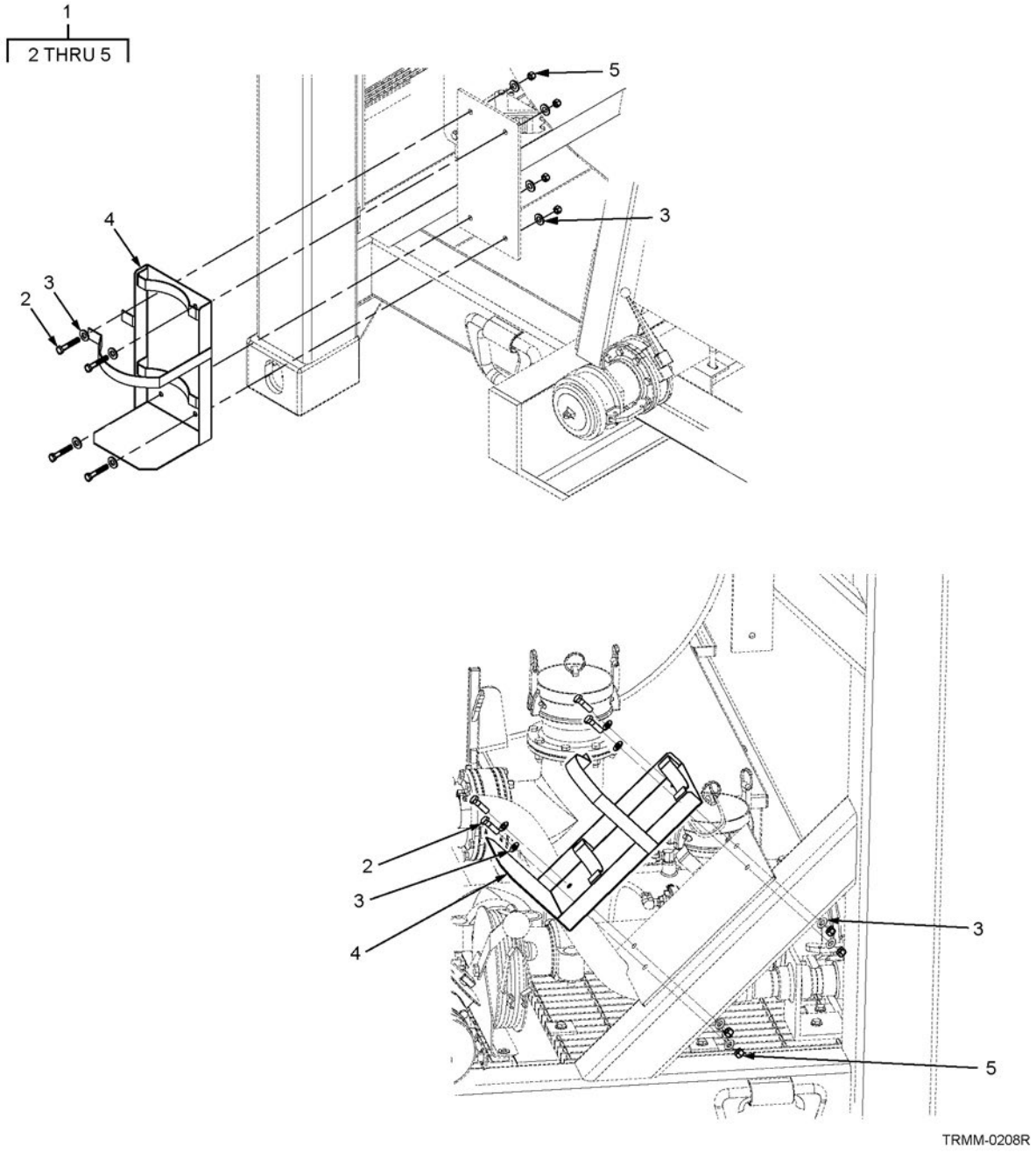


Figure 63. Fire Extinguisher Brackets.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 2100 FIRE EXTINGUISHER BRACKETS	
					FIG. 63. FIRE EXTINGUISHER BRACKETS.	
1	XCFZZ		55242	1051A-51	FIRE EXTINGUISHER BRACKET ASSEMBLY.....	1
* 2	PAFZZ	5305-01-482-6298	39428	92240A624	. BOLT,MACHINE HEXAGON HEAD.....	4
* 3	PAFZZ	5310-01-665-0457	05047	AEW24X37N000SB8A31	. WASHER, FLAT.....	8
4	PAFZZ	4210-01-663-6287	55242	1051A-51-02	. BRACKET, FIRE EXTINGUISHER.....	1
* 5	PAFZZ	5310-01-475-9244	39428	91831A127	. NUT,SELF-LOCKING, HEXAGON.....	4
					END OF FIGURE	

MAINTAINER
ADR ASSOCIATED COMPONENTS

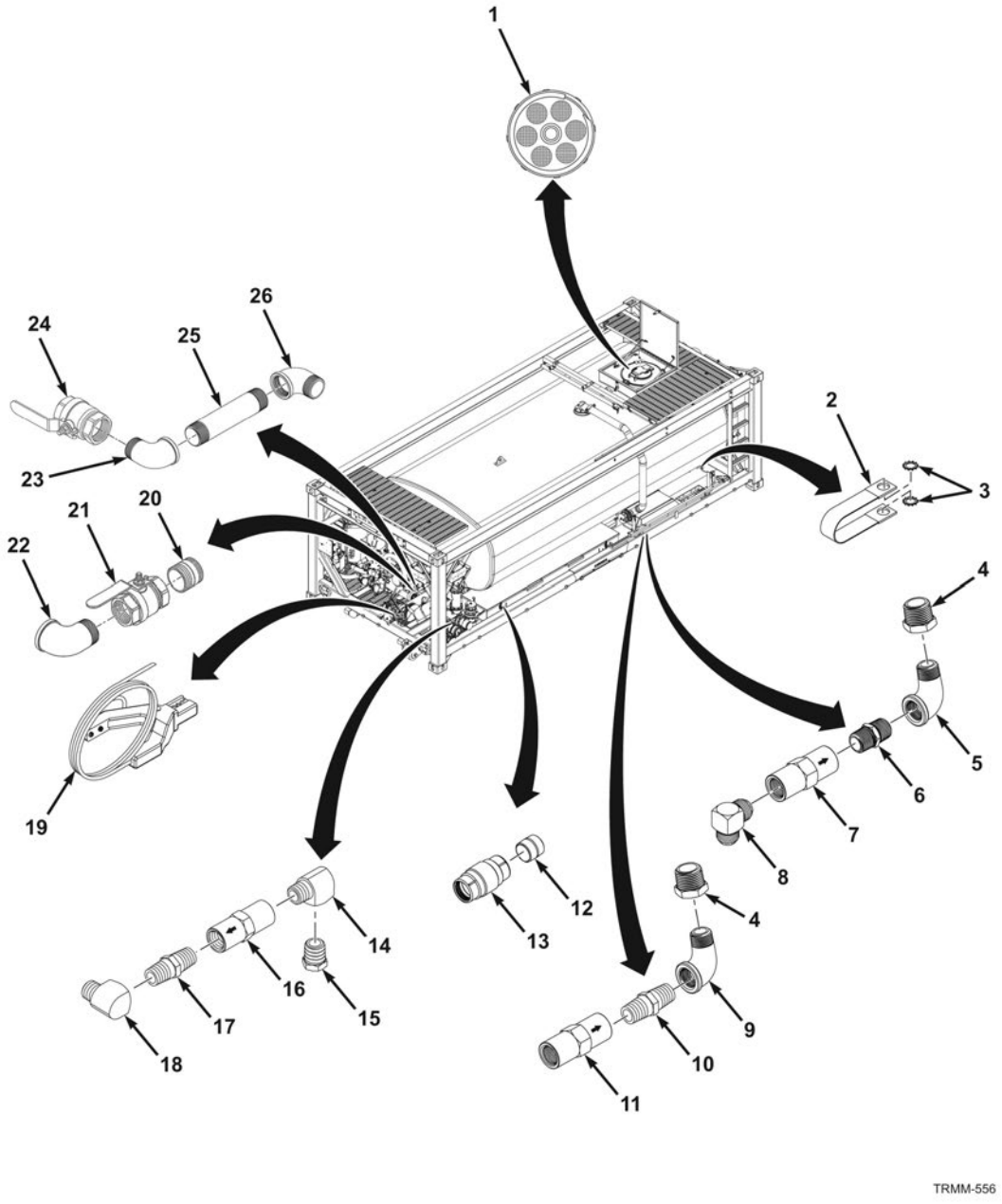


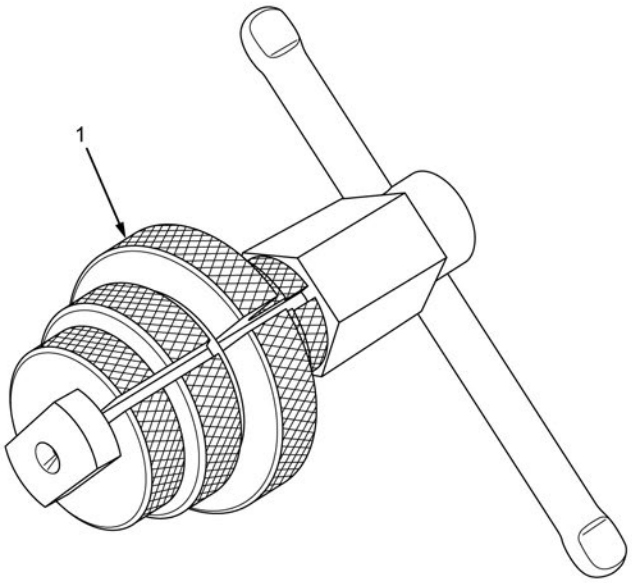
Figure 63.1. ADR Associated Components.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 2300 ADR ASSOCIATED COMPONENTS	
					FIG. 63.1. ADR ASSOCIATED COMPONENTS.	
* 1	PAFZZ	2510-01-696-3836	13226	6234AL277	FLAME ARRESTER VENTILATION-EXHAUST (FIRE SCREEN, INCLUDES RETAINING CLIP AND O-RING)	1
* 2	PAFZZ	5999-01-696-4612	46EU3	GST-009-672-8	STRIP,ELECTRICAL GROUNDING (1.1 IN X 8 IN BRAIDED GROUND)	1
* 3	PAFZZ	5310-00-995-9455	96906	MS35335-67	WASHER,LOCK (5/8 INTERNAL TOOTH LOCK WASHER)	2
* 4	PAFZZ	4730-01-585-3198	39428	4429K413	BUSHING,PIPE (1/2 IN X 3/8 IN BUSHING)	2
* 5	PAFZZ	4730-00-278-4822	39428	4429K152	ELBOW, PIPE (3/8 IN STREET ELBOW)	1
* 6	PAFZZ	4730-00-249-9714	93061	216P-6	NIPPLE,PIPE (3/8 IN HEX NIPPLE)	1
* 7	PAFZZ	4820-01-696-3889	55242	ISO-1532	VALVE,CHECK (V19, 3/8 IN CHECK VALVE)	1
* 8	PAFZZ	4730-01-696-4410	55242	ISO-1541	ELBOW,PIPE TO TUBE (3/8 IN COMPRESSION FITTING)	1
* 9	PAFZZ	4730-01-453-5124	39428	4429K151	ELBOW,STREET (1/4 IN STREET ELBOW)	1
* 10	PAFZZ	4730-00-277-8289	93061	216P-4	NIPPLE (1/4 IN PIPE NIPPLE)	1
* 11	PAFZZ	4820-01-696-4270	55242	ISO-1533	VALVE,CHECK (V18, 1/4 IN CHECK VALVE)	1
* 12	PAFZZ	4730-01-506-4403	39428	4568K261	PIPE NIPPLE (1 1/2 IN PIPE NIPPLE)	1
* 13	PAFZZ	4820-01-696-4290	55242	ISO-1534	VALVE,CHECK (V20, 1 1/2 IN CHECK VALVE)	1
* 14	PAFZZ	4730-01-453-5124	39428	4429K151	ELBOW,STREET (1/4 IN STREET ELBOW)	1
* 15	PAFZZ	5340-01-529-8907	39428	4456K12	PLUG,VENT (1/4 IN BREATHER VENT)	1
* 16	PAFZZ	4820-01-696-4270	55242	ISO-1533	VALVE,CHECK (V23, 1/4 IN CHECK VALVE)	1
* 17	PAFZZ	4730-00-277-8289	93061	216P-4	NIPPLE (1/4 IN PIPE NIPPLE)	1
* 18	PAFZZ	4730-01-453-5124	39428	4429K151	ELBOW,STREET (1/4 IN STREET ELBOW)	1
* 19	PAFZZ	5999-01-696-4367	55242	1051-2-ECP-003-01	STRIP,ELECTRICAL GROUNDING (TRM WITH ADR BONDING CLAMP)	1
* 20	PAFZZ	4730-01-506-4403	39428	4568K261	PIPE NIPPLE (1-1/2 IN PIPE NIPPLE)	1
* 21	PAFZZ	4820-01-665-3778	82666	T-255-FB-P 1-1/2	VALVE,BALL (V22, 1 1/2 IN)	1
* 22	PAFZZ	4730-01-696-4303	55242	ISO-1535	ELBOW,PIPE (1-1/2 IN STREET ELBOW)	1

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
* 23	PAFZZ	4730-01-696-4303	55242	ISO-1535	ELBOW,PIPE (1-1/2 IN STREET ELBOW)	1
* 24	PAFZZ	4820-01-665-3778	82666	T-255-FB-P 1-1/2	VALVE,BALL (V21, 1-1/2 IN)	1
* 25	PAFZZ	4730-01-696-4299	55242	ISO-1539	NIPPLE,PIPE (1-1/2 IN X 8 IN PIPE NIPPLE)	1
* 26	PAFZZ	4730-01-696-4303	55242	ISO-1535	ELBOW,PIPE (1-1/2 IN STREET ELBOW)	1

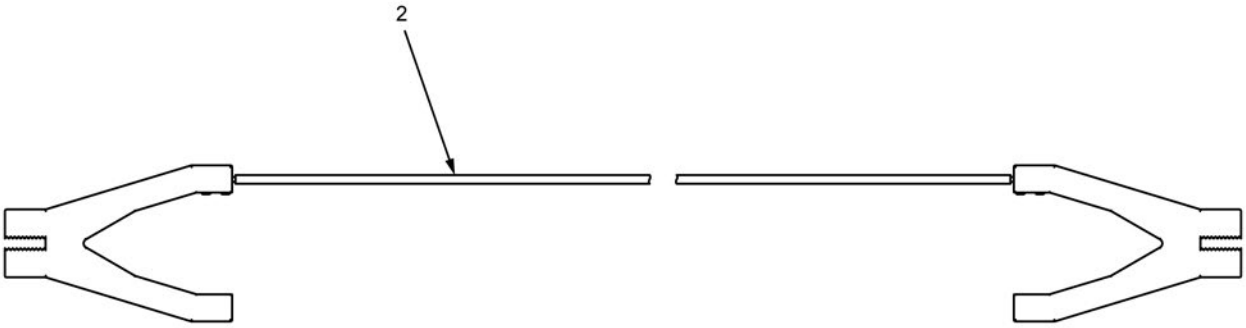
END OF FIGURE

MAINTAINER
SPECIAL TOOLS



504M-0263R

Figure 64. Special Tools (Sheet 1 of 2).



504M-0275

Figure 64. Special Tools (Sheet 2 of 2).

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 2200 SPECIAL TOOLS	
					FIG. 64. SPECIAL TOOLS.	
1	PAFZZ	5120-00-288-8779	50893	31405	INTERNAL PIPE WRENCH.....	1
* 2	PAFZZ	6150-01-664-2460	55242	1051G-26	CABLE ASSEMBLY,SPECIAL PURPOSE,ELECTRICAL (STATIC CABLE).....	1
					END OF FIGURE	

MAINTAINER
NATIONAL STOCK NUMBER INDEX

STOCK NUMBER	FIG.	ITEM
4330-00-062-3836	59	47
4730-00-069-1186	3	14
	4	9
	21	2
	23	4
4730-00-069-1187	7	18
	45	5
	59	10
5945-00-081-9491	47	16
5365-00-138-2158	6	4
4730-00-249-9714	25	11
	65	6
4730-00-277-5736	59	38
4730-00-277-8289	7	20
	25	7
	45	8
	45	12
	45	15
	59	42
	65	10
	65	17
4730-00-278-4822	25	12
	65	5
4730-00-278-4824	7	22
	25	6
	45	7
	45	16
4730-00-278-8825	24	2
5120-00-288-8779	64	1
4730-00-293-7108	24	3
5330-00-391-8491	4	4
	38	3
	39	7
	40	3
	54	2
4730-00-460-2196	38	6
2590-00-559-1588	35	12
5330-00-612-2415	50	3
4730-00-639-9730	3	13
	59	65
4730-00-652-6531	3	12
	59	66
4730-00-855-4916	39	2
	41	2
	42	2
4730-00-855-4919	4	5
	38	2
	39	6
4730-00-855-4919		
	40	2
	54	3
5330-00-899-4509	28	7
	29	7
	33	7
	34	7
	36	3
	54	14
4730-00-929-0787	50	6
4730-00-975-0324	53	3
5310-00-995-9455	65	3
5330-01-024-2311	6	5
4730-01-048-5260	3	10
	5	4
	7	16
	25	3
	45	4
	59	11
4730-01-048-6358	44	33
4730-01-048-6968	44	32
4730-01-048-7873	5	3
	25	2
	45	3
4730-01-048-7874	3	9
	59	4
4730-01-049-1559	59	3
2590-01-054-0253	23	2
4730-01-062-2570	3	11
	7	15
	25	4
	59	39
5306-01-077-5119	6	3
4730-01-086-4064	44	34
5935-01-097-9974	47	31
4820-01-103-7501	33	4
	34	4
	35	5
4730-01-114-4547	39	4
4730-01-115-6643	59	2
5330-01-134-1986	6	6
4730-01-134-3563	25	9
4730-01-134-7759	59	70
4730-01-148-7873	7	17
	59	12
4730-01-164-3365	7	19
	59	61
5330-01-167-2428	39	3

STOCK NUMBER	FIG.	ITEM
5330-01-167-2428		
	41	5
	42	3
4730-01-235-3007	59	9
4730-01-244-4664	27	2
	31	2
	37	6
	42	11
	43	3
	43	14
	43	26
	44	2
	59	7
4730-01-310-4665	44	30
4730-01-334-4297	59	74
5340-01-343-4333	47	38
4730-01-348-6542	44	35
5330-01-398-5050	4	6
5310-01-416-1851	7	9
	11	13
	15	9
	16	10
	21	9
	23	5
	24	6
	26	11
	30	16
	44	28
	46	4
	55	2
	55	15
	58	20
	60	5
4730-01-453-5124	45	10
	45	13
	65	9
	65	14
	65	18
5310-01-463-4929	7	5
	47	23
	49	8
	55	12
	58	5
5310-01-466-8127	47	15
	56	3
5310-01-475-9155	5	8
	12	10
	13	13
	28	2
	29	20
	49	11
	58	8
	58	24

STOCK NUMBER	FIG.	ITEM
5310-01-475-9155		
	59	29
5310-01-475-9244	12	14
	13	8
	14	6
	15	11
	16	2
	18	6
	19	7
	20	6
	27	12
	28	8
	29	2
	31	15
	33	2
	34	2
	35	6
	36	8
	37	3
	40	5
	42	9
	44	13
	54	5
	57	4
	59	24
	62	5
	63	5
4730-01-481-4245	43	7
	43	33
4730-01-481-4976	59	73
4730-01-481-8182	53	4
5305-01-482-6298	63	2
5310-01-483-2638	47	36
5320-01-491-1442	58	25
5310-01-499-3569	11	3
	12	6
	31	17
	32	6
	32	14
	44	9
	55	11
4730-01-506-4403	31	5
	37	2
	42	13
	43	17
	44	4
	59	5
	65	12
	65	20
5935-01-507-4497	47	18
	47	20
5310-01-508-5774	62	11
5305-01-515-3147	26	6

STOCK NUMBER	FIG.	ITEM
5305-01-517-6004	26	13
	27	6
4730-01-517-8518	44	36
5330-01-518-2027	31	10
	44	15
4730-01-521-3792	24	16
3010-01-522-4575	26	12
	27	5
5340-01-529-8907	45	9
	65	15
5305-01-532-9137	47	11
4930-01-535-5944	21	11
5330-01-535-6104	3	2
	4	3
	8	6
5935-01-535-7147	35	3
5998-01-539-6228	47	25
4730-01-540-9708	43	6
	43	32
4730-01-541-1396	31	18
5310-01-547-2721	47	12
5340-01-560-6872	24	9
5305-01-561-5707	47	7
5920-01-562-8032	3	5
	4	12
5305-01-563-7464	49	15
4730-01-573-8259	4	7
5310-01-575-5190	21	8
5330-01-577-5200	28	10
	29	4
	36	6
	52	2
	54	9
4930-01-582-7514	53	12
4730-01-584-1662	28	11
	29	10
	36	7
5306-01-584-9493	31	3
	32	2
	32	11
	44	6
4730-01-585-3198	65	4
2910-01-590-4511	3	17
2840-01-591-1503	47	24
5310-01-592-2747	7	12
	47	14
	49	9
4730-01-595-4173	31	8
	44	14
3040-01-596-4500	21	7
5805-01-602-3816	47	22
5305-01-605-3996	21	4
	59	54
5330-01-606-7073	11	9
4730-01-607-6337	43	4
	43	18
	43	30
4930-01-612-3541	1	1
5306-01-629-9015	16	7
5310-01-630-4148	32	7
	32	15
5940-01-630-7706	58	14
5330-01-641-3634	9	3
	37	12
	51	3
	53	6
2510-01-641-3811	9	4
	37	11
	51	4
	53	7
4730-01-642-2901	59	71
5340-01-645-2593	9	2
	51	2
5930-01-645-2944	47	30
6680-01-645-5697	44	20
5355-01-645-5913	44	22
5930-01-646-6462	47	28
5340-01-646-7059	44	21
2590-01-656-1220	56	1
4730-01-656-1530	28	1
4730-01-656-1910	29	1
6110-01-656-1924	47	39
4720-01-656-2860	52	1
4720-01-657-8268	52	1
4720-01-657-8272	52	1
4720-01-657-8287	51	1
4720-01-657-8288	50	1
4940-01-657-8321	55	1
5330-01-658-0019	43	9
	43	21
5210-01-659-1891	11	12
4930-01-661-7722	53	1
6680-01-661-9473	10	1
4820-01-661-9633	8	1
4710-01-661-9650	5	7
4710-01-661-9653	5	2
4710-01-661-9772	5	9
4730-01-662-0017	21	6
4810-01-662-0222	28	13
	29	11
	36	9
2590-01-662-0763	61	54
2590-01-662-0764	61	50
2590-01-662-0765	61	38
2910-01-662-0766	61	52
2590-01-662-0774	16	5

STOCK NUMBER	FIG.	ITEM
5365-01-662-1094	58	21
2540-01-662-1254	16	8
2510-01-662-1255	12	9
2590-01-662-1259	61	55
2510-01-662-1260	6	1
2510-01-662-1263	15	10
6665-01-662-1523	59	37
6680-01-662-1677	59	55
5362-01-662-1684	58	7
2540-01-662-1694	57	5
2590-01-662-1697	61	53
2590-01-662-1702	12	2
5365-01-662-1716	49	13
4710-01-662-1868	7	24
4710-01-662-1872	7	25
7690-01-662-1880	61	21
4730-01-662-1940	5	10
4330-01-662-2127	59	48
4820-01-662-2151	4	1
2540-01-662-2229	49	17
2590-01-662-2235	58	23
2590-01-662-2240	55	17
2540-01-662-2241	49	1
5930-01-662-2307	47	29
5975-01-662-2352	28	5
	29	18
5980-01-662-2409	47	17
7690-01-662-2413	61	22
6150-01-662-2416	48	11
6665-01-662-2417	59	8
5975-01-662-2418	47	6
7690-01-662-2421	61	26
5999-01-662-2471	59	36
5999-01-662-2476	37	9
	62	6
4820-01-662-2542	9	1
4720-01-662-2551	59	69
4820-01-662-2555	61	19
4820-01-662-2560	61	51
6625-01-662-2580	48	5
5975-01-662-2582	47	2
6625-01-662-2594	48	13
5999-01-662-2601	27	13
4730-01-662-2768	4	8
6680-01-662-2780	59	57
6685-01-662-2788	59	64
6695-01-662-2793	59	63
6625-01-662-2799	47	13
5999-01-662-2804	37	9
5975-01-662-2806	26	5
7690-01-662-2810	61	12
2590-01-662-3003	59	33
7690-01-662-3077	61	10
4820-01-662-3083	61	9
4820-01-662-3089	61	8
4820-01-662-3092	61	20
4720-01-662-3332	30	9
7690-01-662-3707	61	40
4720-01-662-3717	30	7
4720-01-662-3723	30	3
4720-01-662-3729	30	8
4720-01-662-4265	30	12
4720-01-662-4308	30	10
4720-01-662-4311	30	11
4720-01-662-4314	30	4
4720-01-662-4316	30	6
7690-01-662-4329	61	25
7690-01-662-4384	61	16
6150-01-662-4424	48	8
6150-01-662-4426	48	10
4730-01-662-4548	41	3
4730-01-662-4549	38	4
4730-01-662-4553	44	16
4820-01-662-4558	61	23
4710-01-662-4569	31	7
4710-01-662-4578	44	5
4710-01-662-4588	59	44
4730-01-662-4619	29	3
4730-01-662-4622	43	8
	43	20
4930-01-662-4915	62	1
5340-01-662-4916	11	7
4710-01-662-4921	24	21
4710-01-662-4925	59	13
4710-01-662-4932	38	5
4710-01-662-4940	31	6
4710-01-662-4950	40	4
4710-01-662-4953	44	25
4930-01-662-4959	62	8
5340-01-662-4973	54	8
4710-01-662-4976	54	4
4820-01-662-4989	61	24
4730-01-662-5089	27	3
5340-01-662-5096	11	8
5930-01-662-5100	61	11
2590-01-662-5227	58	2
4710-01-662-5234	42	4
4730-01-662-5663	37	10
4730-01-662-5699	59	6
4730-01-662-5705	31	19
4710-01-662-5813	24	19
4710-01-662-5827	24	17
3010-01-662-5843	27	4
4730-01-662-5846	28	14
	29	5
	36	5

STOCK NUMBER	FIG.	ITEM
2590-01-662-6111	58	4
5340-01-662-6377	59	49
4930-01-662-6387	59	1
7690-01-662-6396	61	32
4710-01-662-6463	24	12
4710-01-662-6467	24	13
4710-01-662-6471	24	14
4710-01-662-6480	24	15
4710-01-662-6493	24	18
4710-01-662-6502	24	5
5995-01-662-6561	47	19
5995-01-662-6571	48	7
4820-01-662-6572	61	18
6105-01-662-6575	26	2
5340-01-662-6594	7	13
4720-01-662-6861	30	5
4710-01-662-6862	59	77
4710-01-662-6867	25	8
5315-01-662-6883	17	3
4730-01-662-6888	43	5
	43	31
4710-01-662-6904	44	31
4730-01-662-6907	33	6
	34	6
4710-01-662-6908	24	20
4710-01-662-6912	59	41
4720-01-662-6915	58	1
4710-01-662-6917	59	40
4710-01-662-6922	59	14
4930-01-662-7217	59	45
4710-01-662-7247	60	2
4730-01-662-7249	27	16
	31	9
	44	23
5340-01-662-7389	12	22
	13	5
5340-01-662-7472	30	13
5340-01-662-7480	59	46
4730-01-662-7586	39	5
	41	4
4930-01-662-7593	59	30
4730-01-662-7598	43	1
5340-01-662-7641	7	6
5340-01-662-7659	7	10
5365-01-662-7720	55	5
4720-01-662-7945	45	2
5340-01-662-7948	59	18
5340-01-663-0028	26	9
5340-01-663-0030	31	13
5340-01-663-0033	59	68
5340-01-663-0037	59	28
5340-01-663-0054	44	7
5340-01-663-0055	16	12
5340-01-663-0073	44	17
7690-01-663-0444	61	31
5340-01-663-0535	12	13
5340-01-663-0537	13	4
5340-01-663-0540	13	12
5340-01-663-0541	12	8
7690-01-663-0663	61	41
6150-01-663-0886	48	9
6150-01-663-0901	48	3
6150-01-663-0930	48	2
6150-01-663-0946	48	12
6150-01-663-0950	48	4
7690-01-663-1425	61	6
7690-01-663-1448	61	7
7690-01-663-1473	61	5
7690-01-663-1502	61	29
7690-01-663-1600	61	30
7690-01-663-1670	61	28
7690-01-663-1717	61	39
7690-01-663-1783	61	17
2590-01-663-1924	32	10
7690-01-663-1959	61	34
7690-01-663-1994	61	37
7690-01-663-2048	61	15
4730-01-663-2251	59	76
5340-01-663-2563	7	2
5340-01-663-2568	12	3
5340-01-663-2570	13	7
5340-01-663-2573	19	9
5340-01-663-2663	31	20
5340-01-663-2666	20	7
5340-01-663-2668	12	17
	13	11
5330-01-663-2736	26	4
5340-01-663-2765	19	10
7690-01-663-2921	61	46
7690-01-663-2978	61	2
2590-01-663-3040	32	3
7690-01-663-3186	61	35
7690-01-663-3191	61	36
7690-01-663-3198	61	1
7690-01-663-3203	61	44
7690-01-663-3212	61	27
7690-01-663-3218	61	13
7690-01-663-3225	61	45
7690-01-663-3228	61	4
7690-01-663-3231	61	33
5935-01-663-3239	47	35
5340-01-663-3278	59	20
5340-01-663-3280	59	32
5340-01-663-3281	59	34
5340-01-663-3285	59	23
5340-01-663-3298	44	29

STOCK NUMBER	FIG.	ITEM
2590-01-663-3312	61	47
2590-01-663-3332	61	14
2590-01-663-3968	61	3
5340-01-663-3992	12	19
5340-01-663-3997	18	7
5340-01-663-4277	14	1
5340-01-663-4278	14	2
5340-01-663-4291	15	2
5340-01-663-4293	28	16
3950-01-663-4664	5	6
4010-01-663-4753	15	3
7690-01-663-4812	61	43
7690-01-663-4996	61	48
5330-01-663-5104	7	8
5340-01-663-5638	17	2
	17	7
4010-01-663-5692	22	3
4010-01-663-5716	22	4
4010-01-663-5727	22	1
4010-01-663-5741	22	2
5340-01-663-5941	42	6
5340-01-663-6015	28	12
	29	15
4010-01-663-6041	11	11
	28	17
	29	9
	33	9
	34	8
	36	10
	54	12
3010-01-663-6065	28	9
5340-01-663-6071	12	18
5340-01-663-6109	58	22
4010-01-663-6117	16	11
5340-01-663-6239	24	10
5315-01-663-6263	55	8
4210-01-663-6287	63	4
5340-01-663-6303	18	5
	19	4
	20	5
	21	10
	26	10
	31	14
	33	14
	35	10
	37	7
	42	7
	44	12
	59	67
	62	4
5340-01-663-6324	37	5
5340-01-663-6472	19	6
5340-01-663-6502	27	11
5340-01-663-6527	47	4
5340-01-663-6533	47	8
2590-01-663-6609	56	2
5340-01-663-6623	55	10
7690-01-663-6638	61	42
7690-01-663-6644	61	49
5340-01-663-6649	11	2
4730-01-663-6822	40	8
5340-01-663-6829	49	2
5305-01-663-6836	47	3
4010-01-663-6852	49	16
5330-01-663-6879	58	12
5365-01-663-6913	17	6
4010-01-663-6940	7	14
5330-01-663-6984	49	18
5340-01-663-6989	55	6
5305-01-663-7085	47	33
4730-01-663-7273	28	4
	29	19
5340-01-663-7875	11	10
5310-01-663-7911	33	15
	35	7
5340-01-663-7924	58	16
4010-01-663-7933	50	5
	52	5
5306-01-663-8202	42	10
5365-01-663-8354	12	21
6680-01-663-9706	59	56
5330-01-664-0468	59	58
6150-01-664-2460	64	2
5306-01-664-9226	19	2
	27	8
	31	21
	33	10
	37	8
5306-01-664-9306	28	15
	29	14
5306-01-664-9310	12	12
	59	17
5306-01-664-9631	55	7
5340-01-664-9648	49	7
5340-01-664-9682	58	17
5310-01-665-0387	12	11
	13	10
	28	3
	29	17
	49	10
	58	9
	59	16
5310-01-665-0391	11	4
	12	5
	31	16
	32	4

STOCK NUMBER	FIG.	ITEM
5310-01-665-0391		
	32	12
	44	8
5310-01-665-0396	11	6
	15	6
	16	9
	21	3
	24	7
	26	8
	30	15
	44	27
	46	3
	55	3
	55	14
	60	4
5310-01-665-0457	12	15
	13	3
	14	5
	15	4
	16	3
	18	3
	19	3
	20	3
	27	9
	31	12
	33	11
	35	9
	40	6
	42	8
	44	11
	54	6
	57	3
	59	22
	62	3
	63	3
5310-01-665-0648	59	35
5310-01-665-0650	18	4
	19	8
	20	4
	27	10
	37	4
	46	5
	62	7
	62	10
5306-01-665-0683	12	20
5306-01-665-0702	35	11
	36	4
5306-01-665-0894	14	4
	15	12
	16	4
	33	5
	34	5
5306-01-665-0900	12	7
5925-01-665-1512	47	21
5340-01-665-1702	58	13
5305-01-665-1734	15	5
	44	19
	54	7
	57	2
	59	21
5305-01-665-1749	7	4
	23	6
	24	8
	58	19
5305-01-665-1750	12	16
	13	9
	28	6
	29	16
	58	26
5306-01-665-1752	13	2
	27	15
	29	6
	54	15
	59	27
	59	60
5305-01-665-1756	59	31
5340-01-665-1804	37	13
	53	8
4730-01-665-2006	29	13
	34	9
4330-01-665-2013	43	10
	43	22
5306-01-665-3048	59	19
5310-01-665-3067	33	12
	35	8
	59	26
5310-01-665-3128	32	5
	32	13
5310-01-665-3139	3	4
	4	10
	5	5
	8	2
	59	25
2590-01-665-3190	56	4
6110-01-665-3331	46	1
	47	1
5306-01-665-3440	12	4
5306-01-665-3454	18	2
	19	5
	20	2
	31	11
	33	13
	35	2
	42	5
	44	10
	59	62

STOCK NUMBER	FIG.	ITEM
5306-01-665-3454		
	62	2
5306-01-665-3500	11	5
	15	7
	24	11
	30	14
	44	26
	46	2
	55	4
	55	16
	58	18
4820-01-665-3778	31	4
	42	12
	43	16
	43	27
	44	3
	65	21
	65	24
4320-01-665-3783	37	1
4320-01-665-3789	37	1
4320-01-665-3794	27	17
5306-01-665-3798	26	7
4820-01-665-3799	59	72
5306-01-665-3802	46	7
5306-01-665-3853	54	11
4730-01-665-4041	54	10
4730-01-665-4063	59	52
4720-01-665-4097	58	3
5999-01-665-4122	47	5
5340-01-665-4202	49	14
4820-01-665-4285	4	2
4730-01-665-4292	29	12
4820-01-665-4306	7	21
	25	5
	45	6
	45	14
	59	43
4820-01-665-4310	8	3
4820-01-665-4316	33	1
4820-01-665-4696	34	1
4730-01-665-4706	43	2
	43	19
2910-01-665-4785	3	8
4730-01-665-4845	43	11
	43	23
5330-01-665-5081	33	3
	34	3
	35	4
4730-01-665-5245	53	5
4710-01-665-5327	31	1
4730-01-665-5837	24	4
3040-01-665-6206	3	7
4820-01-665-6212	35	1
4820-01-665-6217	36	1
5999-01-665-6354	53	9
5940-01-665-6358	53	11
4710-01-665-6539	11	1
3040-01-665-6577	21	1
4030-01-665-6614	14	3
2510-01-665-6625	13	6
5340-01-665-6744	33	8
	52	6
5305-01-665-7286	49	4
	58	10
5305-01-665-7344	47	32
	58	6
6150-01-665-7391	48	6
5310-01-665-7706	43	12
	43	24
5305-01-665-7710	43	13
	43	25
5310-01-665-7753	27	14
	44	18
	47	34
	59	59
5305-01-665-7766	47	27
5305-01-665-7774	7	7
	47	26
	49	6
	55	9
	58	15
5305-01-665-7782	60	3
4030-01-665-8337	3	15
	16	6
	21	5
	23	3
5315-01-665-8790	3	6
	4	11
5340-01-666-0689	17	4
5340-01-666-0727	17	1
5340-01-666-0731	17	1
5310-01-666-0890	1	5
5305-01-666-0895	47	37
5305-01-666-0908	53	10
5340-01-666-0925	29	8
	36	2
	52	4
	54	13
5340-01-666-0927	50	4
5315-01-666-0937	3	3
	17	5
5340-01-666-1654	46	6
5306-01-666-2968	47	9
5310-01-666-3052	1	3
5310-01-666-3053	1	4
5310-01-666-5326	49	5

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5310-01-666-5326		
	58	11
5310-01-667-3730	23	7
5315-01-667-4317	4	13
5310-01-667-4803	47	10
5340-01-667-6663	15	8
5305-01-667-7347	1	2
4730-01-667-8850	44	24
	59	15
5340-01-668-6407	16	1
4930-01-669-3001	2	1
4730-01-671-9517	30	2
5306-01-674-8876	11	14
3010-01-675-5222	27	7
5306-01-676-1129	40	7
5310-01-677-1166	49	3
2540-01-682-9585	1	6
5315-01-690-3525	17	8
2510-01-696-3836	6	7
	65	1
4820-01-696-3889	25	10
	65	7
4820-01-696-4270	45	11
4820-01-696-4270		
	65	11
	65	16
4820-01-696-4290	65	13
4730-01-696-4299	43	29
	65	25
4730-01-696-4303	43	15
	43	28
	65	22
	65	23
	65	26
5999-01-696-4367	62	9
	65	19
4730-01-696-4410	65	8
5999-01-696-4612	65	2
4930-01-697-4809	53	2
4720-01-706-6690	30	18
4720-01-706-6693	30	17
4720-01-706-6701	30	19
2540-20-010-5587	7	11
2540-20-010-6113	49	12
4730-99-371-9140	7	23
	59	75

END OF WORK PACKAGE

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	33	7
	34	7
	36	3
	54	14
AA59326-G5	11	9
AA59326-G8	50	3
AA59326/10-8-A	50	6
AEB02C250750CH2A31	7	4
	23	6
	24	8
	58	19
AEB02C250A00CH2A31	11	5
	15	7
	24	11
	30	14
	44	26
	46	2
	55	4
	55	16
	58	18
AEB02C250A25CH2A31	46	7
AEB02C250A50CH2A31	16	7
AEB02C250C25CH2A31	26	7
AEB02C312500SB8A31	47	9
AEB02C312A00CH2A31	12	4
AEB02C312A25CH2A31	12	7
AEB02C312B25CH2A31	12	20
AEB02C312B50CH2A31	55	7
AEB02C375A25CH2A31	15	5
	44	19
	54	7
	57	2
	59	21
AEB02C375A50CH2A31	13	2
	27	15
	29	6
	54	15
	59	27
	59	60
AEB02C375A75CH2A31	54	11
AEB02C375B25CH2A31	14	4
	15	12
	16	4
	33	5
	34	5
AEB02C375B50CH2A31	18	2
	19	5
	20	2
	31	11
	33	13
	35	2
	42	5
	44	10
	59	62
	62	2
AEB02C375B75CH2A31	19	2
	27	8
	31	21
	33	10
	37	8
AEB02C375C00CH2A31	35	11
	36	4
AEB02C375C75CH2A31	28	15
	29	14
AEB02C500A50CH2A31	12	12
	59	17
AEB02C500A75CH2A31	12	16
	13	9
	28	6
	29	16
	58	26
AEB02C500B50CH2A31	59	19
AEB02C500D50CH2A31	59	31
AEB02C625C50WA6M31	1	2
AEN04C312000SB8A31	32	5
	32	13
AEN04C375000SB8A31	33	12
	35	8
	59	26
AEN04C500000SB8A31	3	4
	4	10
	5	5
	8	2
	59	25
AEN04C625000WB0M31	1	5
AEP01X312750SB8A31	4	13
AEP01X375A75SB8A31	3	16
AEP02X125A00SB8A31	3	6
	4	11
AEP02X187C00SB8A31	3	3
	17	5
AES14C164500DR2A31	10	4
AESF5C164375CH2A31	53	10
AESF5C190500CH2A31	7	7

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	47	26
	49	6
	55	9
	58	15
AESF5C190750CH2A31	47	27
AESF5C190A00CH2A31	47	32
	58	6
AESF5C250750CH2A31	60	3
AESF6C138500SB8A31	47	37
AESL4C500A50SB8A31	49	4
	58	10
AEW07X375000SB8A31	27	14
	44	18
	47	34
	59	59
AEW07X612000SB8A31	1	4
AEW11X375000SB8A31	18	4
	19	8
	20	4
	27	10
	37	4
	46	5
	62	7
	62	10
AEW11X500000SB8A31	59	35
AEW15X312880WJ1AC1	47	10
AEW24X25N000SB8A31	11	6
	15	6
	16	9
	21	3
	24	7
	26	8
	30	15
	44	27
	46	3
	55	3
	55	14
	60	4
AEW24X31N000SB8A31	11	4
	12	5
	31	16
	32	4
	32	12
	44	8
AEW24X37N000SB8A31	12	15
	13	3
	14	5
	15	4
	16	3
	18	3
	19	3
	20	3
	27	9
	31	12
	33	11
	35	9
	40	6
	42	8
	44	11
	54	6
	57	3
	59	22
	62	3
	63	3
AEW24X50N000SB8A31	12	11
	13	10
	28	3
	29	17
	49	10
	58	9
	59	16
AEW24X625000WJ1M31	1	3
C-DT04-2P-RT01	47	18
	47	20
CA121003-5	47	38
DC60F	47	22
EV46158ALTS	4	2
F030010A00	38	6
F030020A00	38	4
F040010A00	39	4
F040020A00	41	3
G014077LT0	31	10
	44	15
G020077LT0	4	6
G030077LT0	4	4
	38	3
	39	7
	40	3
	54	2
G040077LT0	39	3
	41	5
	42	3
G150-DC-AL	11	10
G400-ALT-AL	54	10
GST-009-672-8	65	2
HC-59-PA66-BK	59	76
HC-G-PA66-BK	7	23
	59	75
ISO-048	24	4
ISO-1130	17	8
ISO-1133	27	3
ISO-1142	31	19
ISO-1163	40	8
ISO-1202	5	10
ISO-1203	7	6
ISO-1215	55	5

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ISO-1532	25	10
	65	7
ISO-1533	45	11
	65	11
	65	16
ISO-1534	65	13
ISO-1535	43	15
	43	28
	65	22
	65	23
	65	26
ISO-1539	43	29
	65	25
ISO-1541	65	8
ISO-531-02	59	58
ISO-531-04	59	55
ISO-531-05	59	57
ISO-783-02	59	45
ISO-783-07	59	46
ISO-797	10	2
ISO-808	28	4
	29	19
ISO-809	12	22
	13	5
ISO-814	7	10
ISO-815	7	13
IVAL763CXB	6	1
IVAL763CXB073	6	2
J246 8 100110B	3	9
L014075PT0	31	8
	44	14
L020075PT0	4	7
L030075PT0	4	5
	38	2
	39	6
	40	2
	54	3
L040075PT0	39	2
	41	2
	42	2
L099/100	27	7
M370B091A0060A	52	3
M370B091A0080A	52	3
M370B091A0150A	52	3
MC-320002	59	48
MS35335-67	65	3
OP9002EY	21	7
P-105-4	23	7
PL5250	44	21
RJ0001	9	4
	37	11
	51	4
	53	7
RJ0002-1	9	5
RJ0009	9	3
	37	12
	51	3
	53	6
RJ0024-1	9	6
RJA1002	9	2
	51	2
RJA1154	37	13
	53	8
RST20	27	2
	31	2
	37	6
	42	11
	43	3
	43	14
	43	26
	44	2
	59	7
S0121-0060	46	6
S0122-FS05	3	15
	16	6
	21	5
	23	3
SAE J246 100202BA	59	2
SAE J246 4 100115B	44	33
SAE J246 4-4 100202BA	44	34
SAE J246 6 100110B	5	3
	7	17
	25	2
	45	3
	59	12
SAE J246 6 100115B	3	10
	5	4
	7	16
	25	3
	45	4
	59	11
SAE J246 6 120111B	24	2
SAE J246 6 120115B	24	3
SAE J246 6-4 100102BA	3	11
	7	15
	25	4
	59	39
SAE J246 6-4 100202BA	7	18
	45	5
	59	10
SAE J246 6-4 120102BA	3	14
	4	9
	21	2
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SAE J246 8-8 100102BA	59	70
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	59	66
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	59	65
SAE J530 4-4 130138B	59	38
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SKM-331	32	1
SKM-331-01	32	3
SKM-332	32	9
SKM-332-01	32	10
SS074032-1013	49	7
SS093064-881	58	17
STAR-SS-32HT-M1	30	13
T-255-FB-P 1	59	72
T-255-FB-P 1-1/2	31	4
	42	12
	43	16
	43	27
	44	3
	65	21
	65	24
T-255-FB-P 1/4	7	21
	25	5
	45	6
	45	14
	59	43
TN860AN1CAB2GAC	44	20
USC10012	37	10
USC10013	9	1
USC10112	53	5
VS269NTA-8-8	44	30
WD301ALB	33	4
	34	4
	35	5
WD404ALB	28	13
	29	11
	36	9
0431173551	47	25
0444176451	47	24
10232D	3	2
	4	3
	8	6
1051-13-02	53	9
1051-2-ECP-003-01	62	9
	65	19
1051-2-ECP-003-04-06	61	56
1051A	1	1
1051A-02	58	1
1051A-02-06	58	2

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1051A-02-07	58	4
1051A-02-14	58	21
1051A-02-20	58	7
1051A-02-21	58	23
1051A-02-30	58	12
1051A-02-32	58	3
1051A-03-06	52	1
1051A-03-08	52	1
1051A-03-15	52	1
1051A-04	49	1
1051A-04-01	49	2
1051A-04-02	49	17
1051A-04-05	49	13
1051A-04-23	49	18
1051A-04-25	49	16
1051A-05	55	1
1051A-05-07	55	10
1051A-05-13	55	6
1051A-07	11	1
1051A-07-01	11	12
1051A-07-10	11	2
1051A-08	51	1
1051A-08-01	51	5
1051A-09	54	1
1051A-09-07	54	8
1051A-09-10	54	4
1051A-13	53	1
1051A-27	50	1
1051A-27-01	50	2
1051A-28	56	1
1051A-28-08	56	4
1051A-28-11	56	2
1051A-32	58	13
1051A-34	49	14
1051A-41	62	1
1051A-41-01	62	8
1051A-42	55	8
1051A-51	63	1
1051A-51-02	63	4
1051B	2	1
1051B-01-14	3	7
1051B-01-15	8	5
1051B-02	7	1
1051B-02-02	7	2
1051B-02-04	7	3
1051B-04	7	8
1051B-05	5	1
1051B-05-01	5	9
1051B-05-02	5	7
1051B-05-03	5	2
1051B-05-05	5	6
1051B-08	3	1
1051B-09	4	1

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1051B-10	10	1
1051B-11	8	1
1051B-15	7	14
1051B-21	8	3
1051B-22	3	8
1051C-01-102	59	28
1051C-01-112	19	6
1051C-01-114	15	8
1051C-01-32	24	10
1051C-01-43	27	11
1051C-01-47	31	20
1051C-01-48	44	29
1051C-01-80	55	13
1051C-01-80-01	55	17
1051C-01-88	18	5
	19	4
	20	5
	21	10
	26	10
	31	14
	33	14
	35	10
	37	7
	42	7
	44	12
	59	67
	62	4
1051C-01-89	59	23
1051C-01-91	15	10
1051C-01-95	59	68
1051C-01-96	11	7
1051C-01-98	11	8
1051C-02	17	1
1051C-02-01	17	2
	17	7
1051C-02-04	17	6
1051C-03	57	1
1051C-03-03	57	5
1051C-04	13	1
1051C-04-01	13	6
1051C-04-02	13	12
1051C-04-04	12	17
	13	11
1051C-04-06	13	7
1051C-06	12	1
1051C-06-06	12	21
1051C-06-10	12	2
1051C-06-11	12	19
1051C-06-12	12	18
1051C-07	18	1
1051C-07-01	18	7
1051C-08	12	9
1051C-10-01	12	13

PART NUMBER	FIG.	ITEM
1051C-11	20	1
1051C-11-01	20	7
1051C-12	14	1
1051C-12-02	14	2
1051C-12-03	14	3
1051C-13	16	1
1051C-13-02	16	8
1051C-13-03	16	12
1051C-13-05	16	5
1051C-13-06	16	11
1051C-16	12	3
1051C-17	13	4
1051C-18	12	8
1051C-21	19	1
1051C-21-01	19	10
1051C-22	17	1
1051C-23	19	9
1051C-25	15	1
1051C-25-01	15	2
1051C-25-03	15	3
1051C-28	1	6
1051D-01-01	61	47
1051D-01-02	61	46
1051D-01-03	61	13
1051D-01-04	61	14
1051D-01-05	61	43
1051D-01-06	61	42
1051D-01-07	61	6
1051D-01-08	61	7
1051D-01-09	61	5
1051D-01-10	61	1
1051D-01-11	61	44
1051D-01-12	61	4
1051D-01-13	61	52
1051D-01-14	61	53
1051D-01-15	61	38
1051D-01-16	61	2
1051D-02-01	61	35
1051D-02-02	61	33
1051D-02-03	61	27
1051D-02-04	61	32
1051D-02-05	61	15
1051D-02-06	61	34
1051D-02-07	61	36
1051D-02-08	61	37
1051D-03-02	61	48
1051D-03-03	61	45
1051D-03-04	61	50
1051D-03-06	61	49
1051D-03-07	61	3
1051D-03-08	61	55
1051D-03-09	61	54
1051D-04-01	61	20

PART NUMBER	FIG.	ITEM
1051D-04-02	61	21
1051D-04-03	61	51
1051D-04-04	61	9
1051D-04-05	61	10
1051D-04-06	61	19
1051D-04-07	61	8
1051D-04-08	61	40
1051D-04-09	61	25
1051D-04-10	61	23
1051D-04-11	61	24
1051D-04-12	61	26
1051D-04-13	61	18
1051D-04-14	61	16
1051D-04-15	61	22
1051D-04-16	61	12
1051D-04-17	61	11
1051D-04-18	61	17
1051D-04-19	61	58
1051D-04-20	61	60
1051D-04-21	61	57
1051D-04-22	61	59
1051D-04-23	61	61
1051D-04-24	61	62
1051D-04-25	61	63
1051D-05-01	61	28
1051D-05-02	61	39
1051D-05-03	61	31
1051D-05-04	61	30
1051D-05-05	61	29
1051D-05-06	61	41
1051D-10	60	1
1051D-10-01	60	2
1051E	24	1
1051E-01-01	24	17
1051E-01-02	24	18
1051E-01-03	24	15
1051E-01-04	24	14
1051E-01-05	24	21
1051E-01-06	24	5
1051E-01-07	24	20
1051E-01-08	24	12
1051E-01-09	24	19
1051E-01-10	24	13
1051E-02-01	22	3
1051E-02-02	22	4
1051E-02-03	22	1
1051E-02-04	22	2
1051E-11	21	1
1051E-12	23	1
1051F-01-03	40	4
1051F-01-05	38	5
1051F-01-06	42	4
1051F-01-07	44	17
1051F-01-09	37	5
1051F-01-10	33	6
	34	6
1051F-01-11	44	7
1051F-01-12	31	13
1051F-01-13	42	6
1051F-01-14	33	15
	35	7
1051F-01-15	26	9
1051F-01-17	39	5
	41	4
1051F-01-19	44	16
1051F-01-20	27	16
	31	9
	44	23
1051F-01-22	43	5
	43	31
1051F-01-23	45	1
1051F-01-24	25	1
1051F-01-25	38	1
1051F-01-25-01	33	1
1051F-01-25-02	35	1
1051F-01-26	42	1
1051F-01-26-01	36	1
1051F-01-27	40	1
1051F-01-27-01	34	1
1051F-01-28	41	1
1051F-01-29	39	1
1051F-01-33	28	5
	29	18
1051F-04	43	1
1051F-05	44	1
1051F-06	30	1
1051F-06-02	30	3
1051F-06-03	30	11
1051F-06-04	30	8
1051F-06-06	30	12
1051F-06-06-ADR	30	17
1051F-06-08	30	9
1051F-06-09	30	6
1051F-06-10	30	7
1051F-06-10-ADR	30	19
1051F-06-11	30	5
1051F-06-12	30	4
1051F-06-13	30	10
1051F-06-13-ADR	30	18
1051F-07	44	25
1051F-08	31	7
1051F-09	44	5
1051F-10	31	6
1051F-17	29	1
1051F-17-01	28	12
	29	15

PART NUMBER	FIG.	ITEM
1051F-18	28	1
1051F-18-01	11	11
	28	17
	29	9
	33	9
	34	8
	36	10
	54	12
1051F-21-01	7	24
1051F-21-02	7	25
1051F-21-03	44	31
1051F-21-05	45	2
1051F-21-06	59	77
1051F-21-08	25	8
1051F-22	26	1
1051F-22-01	26	5
1051F-22-04	26	4
1051F-22-10	26	2
1051F-25	50	5
	52	5
1051F-27	27	1
1051F-29	37	1
1051F-30	37	1
1051F-35	31	1
1051F-36	28	9
1051F-36-01	28	16
1051F-40	27	17
1051G	46	1
	47	1
1051G-01	47	2
1051G-01-01	47	4
1051G-01-05	47	6
1051G-01-06	47	8
1051G-02-06	47	5
1051G-03	48	7
1051G-06	47	39
1051G-09	37	9
	62	6
1051G-10	37	9
1051G-11	59	36
1051G-12	27	13
1051G-13	47	13
1051G-20-01	48	5
1051G-20-02	48	2
1051G-20-03	48	13
1051G-20-04	48	12
1051G-20-05	48	4
1051G-21-01	48	8
1051G-21-02	48	9
1051G-21-03	48	11
1051G-21-04	48	10
1051G-21-05	48	3
1051G-22	47	17
1051G-23	47	19
1051G-24	48	6
1051G-25	47	35
1051G-26	64	2
1051G-30	48	1
1060	59	1
1060-01	59	30
1060-01-07	59	33
1060-01-08	59	34
1060-01-09	59	20
1060-01-10	59	37
1060-01-11	59	8
1060-01-12	59	32
1060-01-13	59	56
1060-02	59	18
1060-03-01	59	44
1060-03-02	59	41
1060-03-03	59	14
1060-03-04	59	40
1060-03-05	59	13
1060-03-06	59	69
1060-04	59	6
1060-06	59	63
1060-10	59	49
1060-14	59	64
109256.00	26	3
11674728	47	31
11974-01523	40	7
13-1-0773	58	14
13229E0849	7	19
	59	61
1456512N	53	2
19M-P10-B-070-02	47	21
200 96 H B	24	16
20040A001	21	11
20189D	28	11
	29	10
	36	7
209P-16-8	59	71
209P-8-4	44	35
21050A	3	5
	4	12
216P-4	7	20
	25	7
	45	8
	45	12
	45	15
	59	42
	65	10
	65	17
216P-6	25	11
	65	6
2224P-8	44	36

PART NUMBER	FIG.	ITEM
24-24 141439FB	44	24
	59	15
24063	47	16
285---0203 MYP	43	11
285-0203 MYP	43	23
285-1406 2S	43	20
285-1406_2S	43	8
285AL-0108 2N	43	12
	43	24
285AL-0201 MB	43	2
	43	19
285AL-0202 MC	43	10
	43	22
285AL-0204 2S	43	13
	43	25
285B--2205 2G	43	9
	43	21
300-DP-AL	50	4
300510200	30	2
300ALMM 200 ANAJ	53	12
300GTTFCB	33	3
	34	3
	35	4
3036SL	6	4
3119BN	6	5
31405	64	1
320F-K184-C	29	3
3225T63	24	9
3289283	58	25
35603SL	23	2
3560BN	6	6
3701-1594	17	3
3701-7617 BUFFERS	17	4
38X4.5X6RDSS	42	10
4 100110B	44	32
4-4 140239B	7	22
	25	6
	45	7
	45	16
400-020-319	10	3
400-DC-AL	29	8
	36	2
	52	4
	54	13
400-DLT-AL	29	12
400-DP-AL	29	13
	34	9
400-G-BU	28	10
	29	4
	36	6
	52	2
	54	9
404-DP-AL	33	8

PART NUMBER	FIG.	ITEM
	52	6
4121SL001	6	3
41607	35	12
4429K151	45	10
	45	13
	65	9
	65	14
	65	18
4429K152	25	12
	65	5
4429K155	59	74
4429K257	31	18
4429K258	43	6
	43	32
4429K413	65	4
4429K426	53	4
4456K12	45	9
	65	15
4464K175	43	4
	43	18
	43	30
4568K221	59	73
4568K261	31	5
	37	2
	42	13
	43	17
	44	4
	59	5
	65	12
	65	20
465.4.07.150.432.135.416	49	12
465.407.200.511.180.418	7	11
4706P	49	3
4830K221	53	3
50459 1	11	14
50A-3-2	4	8
61528BC	35	3
6234AL277	6	7
	65	1
633LAT-AL40	28	14
	29	5
	36	5
640269	59	47
64129A	3	17
64168	8	4
65GCPN120	59	50
65NB010060	59	51
	59	53
65SF3120	59	52
666-2-MB	58	16
70205K4	47	30
7113K551	53	11
7343K731	47	29

PART NUMBER	FIG.	ITEM
75920	47	28
777-1	58	22
800G8870	44	22
804120	27	4
863-000396	43	7
	43	33
8896T129	31	3
	32	2
	32	11
	44	6
8896T163	32	8
	32	16
90279A827	47	3
90316A537	26	6
906147	26	12
	27	5
90715A145	62	11
91375A576	26	13
	27	6
91500A242	49	15
91772A245	47	7
91831A007	47	36
91831A011	7	5
	47	23
	49	8
	55	12
	58	5
91831A029	7	9
	11	13
	15	9
	16	10
	21	9
	23	5
	24	6
	26	11
	30	16
	44	28
	46	4
	55	2
	55	15
	58	20
	60	5
91831A030	11	3
	12	6
	31	17
	32	6
	32	14
	44	9
	55	11
91831A127	12	14
	13	8
	14	6
	15	11
	16	2
	18	6
	19	7
	20	6
	27	12
	28	8
	29	2
	31	15
	33	2
	34	2
	35	6
	36	8
	37	3
	40	5
	42	9
	44	13
	54	5
	57	4
	59	24
	62	5
	63	5
91831A137	5	8
	12	10
	13	13
	28	2
	29	20
	49	11
	58	8
	58	24
	59	29
91855A540	32	7
	32	15
92198A550	21	4
	59	54
92240A351	47	33
92240A624	63	2
92865A624	47	11
93776A461	47	15
	56	3
94000A038	21	8
94831A030	7	12
	47	14
	49	9
95795A030	47	12
9Z4873	21	6

END OF WORK PACKAGE

CHAPTER 5

SUPPORTING INFORMATION

MAINTAINER REFERENCES

SCOPE

This work package lists the publications referenced in this manual.

ARMY REGULATIONS

AR 700-138	Army Logistics Readiness and Sustainability

ARMY TECHNICAL PUBLICATIONS

ATP 4-43	Petroleum Supply Operations

DA PAMPHLETS

DA PAM 738-750	Functional Users Manual for The Army Maintenance Management System (TAMMS)
DA PAM 738-751	Functional Users Manual for the Army Maintenance Management System-Aviation (TAMMS-A)
DA PAM 750-8	The Army Maintenance Management System (TAMMS) Users Manual

FIELD MANUALS

TC 4-02.1	First Aid

FORMS

DA Form 2028	Recommended Changes to Publications and Blank Forms
DA Form 2404	Equipment Inspection and Maintenance Worksheet
DA Form 5988-E	Equipment Maintenance and Inspection Worksheet (Automated)
DD Form 361	Transportation Discrepancy Report
SF 368	Product Quality Deficiency Report

MISCELLANEOUS

CTA 8-100	Common Table of Allowances, Army Medical Department Expendable/Durable Items

MISCELLANEOUS - Continued

CTA 50-909	Common Table of Allowances, Field and Garrison Furnishings and Equipment
CTA 50-970	Common Table of Allowances, Expendable/Durable Items (Except Medical, Class V Repair Parts, and Heraldic Items)

REGULATIONS

DTR 4500.9-R	Defense Transportation Regulation Part II

TECHNICAL MANUALS

TM 10-4930-371-10	Technical Manual, Operator Manual for Modular Fuel System Tank Rack Module (MFS TRM) M107A1
TM 750-244-6	Procedures for Destruction of Tank-Automotive Equipment to Prevent Enemy Use

END OF WORK PACKAGE

MAINTAINER
MAINTENANCE ALLOCATION CHART (MAC) INTRODUCTION

INTRODUCTION

The Army Maintenance System MAC

This introduction provides a general explanation of the maintenance and repair functions.

The MAC (immediately following this introduction) designates overall authority and responsibility for the performance of maintenance tasks on the identified end item or component. The application of the maintenance tasks to the end item or component shall be consistent with the capacities and capabilities of the designated maintenance levels/classes, which are shown in the MAC in column (4). Column (4) is divided into two secondary columns. These columns indicate the maintenance levels/classes of ‘Field’ and ‘Sustainment’. Each maintenance level column is further divided into two sub-columns. These sub-columns identify the maintenance classes and are as follows:

1. Field level maintenance classes:
    a. Crew (operator) maintenance. This is the responsibility of a using organization to perform maintenance on its assigned equipment. It normally consists of inspecting, servicing, lubricating, adjusting, and replacing parts, minor assemblies, and subassemblies. Items with a “C” (“O” for joint service reporting) in the third position of the Source, Maintenance, and Recoverability (SMR) code may be replaced at the crew(operator) class. A code of “C” (“O” for joint service) in the fourth position of the SMR code indicates complete repair is authorized at the crew (operator) class.
    b. Maintainer maintenance. This is maintenance accomplished on a component, accessory, assembly, subassembly, plug-in unit, or other portion by field level units. This maintenance is performed either on the system or after it is removed. An “F” in the third position of the SMR code indicates replacement of assemblies, subassemblies, or other components is authorized at this level. An “F” in the fourth position of the SMR code indicates complete repair of the identified item is allowed at the Maintainer class. Items repaired at this level are normally returned to the user after maintenance is performed.
2. Sustainment level maintenance classes:
    a. Below depot sustainment. This is maintenance accomplished on a component, accessory, assembly, subassembly, plug-in unit, or other portion either on the system or after it is removed. The item subject to maintenance has normally been forwarded to a maintenance facility away from the field level supporting units. An “H” in the third position of the SMR code indicates replacement of assemblies, subassemblies, or other components is authorized at this class. An "H" appearing in the fourth position of the SMR code indicates complete repair is possible at this class. Items are normally returned to the supply system after maintenance is performed at this class.
    b. Depot. This is maintenance accomplished on a component, accessory, assembly, subassembly, plug-in unit, or other portion either on the system or after it is removed. Assets to be repaired at this class are normally returned to an Army Depot or authorized contractor facility. The replace function for this class of maintenance is indicated by the letter "D" or "K" appearing in the third position of the SMR code. A "D" or "K" appearing in the fourth position of the SMR code indicates complete repair is possible at the depot sustainment maintenance level. Items are returned to the supply system after maintenance is performed at this class.

The tools and test equipment requirements table (immediately following the MAC) lists the tools and test equipment (both special tools and common tool sets) required for each maintenance task as referenced from the MAC.

INTRODUCTION - Continued

The remarks table (immediately following the tools and test equipment requirements) contains supplemental instructions and explanatory notes for a particular maintenance task.

Maintenance functions (tasks)

Maintenance functions are limited to and defined as follows:

1. Inspect. To determine the serviceability of an item by comparing its physical, mechanical, and/or electrical characteristics with established standards through examination (e.g. by sight, sound, or feel).
2. Test. To verify serviceability by measuring the mechanical, pneumatic, or electrical characteristics of an item and comparing those characteristics with prescribed standards, e.g., load testing of lift devices or hydrostatic testing of pressure hoses.
3. Service. Operations required periodically to keep an item in proper operating condition such as replenishing fuel, lubricants, chemical fluids, or gases.
4. Adjust. To maintain or regulate, within prescribed limits, by bringing into proper position, or by setting the operating characteristics to specified parameters.
5. Align. To adjust specified variable elements of an item to bring about optimum or desired performance.
6. Calibrate. To determine and cause corrections to be made or to be adjusted on instruments of test, measuring, and diagnostic equipment used in precision measurement. It consists of comparisons of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.
7. Remove. The act of taking a component off an asset to facilitate other maintenance on a different component or on the same component (except for replace and repair).
8. Install. The act of placing, positioning, or otherwise locating a component to make it part of a higher level end item. The install task is authorized by the LMI/MAC and the assigned maintenance level is shown as the third position code of the SMR code.
9. Replace. The act of taking off an unserviceable component and putting a serviceable component in its place. The replace task is authorized by the LMI/MAC and the assigned maintenance level is shown as the third position code of the SMR code.
10. Repair. The act of restoring an item to a completely serviceable or fully mission capable status. The repair task is authorized by the LMI/MAC and the assigned maintenance level is shown as the fourth position code of the SMR code.
11. Paint. This is a function to prepare and apply coats of paint. When used with munitions, the paint is applied so the ammunition can be identified and protected.

NOTE

The following definitions are applicable to the “repair” maintenance task:
Fault location/troubleshooting. The process of investigating and detecting the cause of equipment malfunctioning; the act of isolating a fault within a system or Unit Under Test (UUT).
Actions. Welding, grinding, riveting, straightening, facing, machining, and/or resurfacing.

12. Overhaul. This is the maintenance effort (service/action) prescribed to restore an item to a completely serviceable/operational condition as required by maintenance standards in the appropriate technical publications. Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to a like new condition.
13. Rebuild. This consists of those services/actions necessary for the restoration of unserviceable equipment to a like new condition IAW original manufacturing standards. Rebuild is the highest degree of materiel

INTRODUCTION - Continued

maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (e.g., hours/miles) considered in classifying Army equipment/components.

14. Lubricate. The act of applying a material (e.g., oil or grease) to reduce friction and allow a component to operate in a more efficient manner.
15. Mark. The process of restoring obliterated identification on an asset.
16. Pack. To place an item into a container for either storage or shipment after service and other maintenance operations have been completed.
17. Unpack. The act or removing an asset from a storage or shipping container in preparation to perform further maintenance (e.g., repair or install).
18. Preserve. The action required to treat systems and equipment whether installed or stored, to ensure a serviceable condition.
19. Prepare for use. Those steps required to make an asset ready for other maintenance (e.g., remove preservatives, lubricate, etc.).
20. Assemble. The step-by-step instructions to join the component pieces of an asset together to make a complete serviceable asset.
21. Disassemble. The step-by-step breakdown (taking apart) of a spare/functional group coded item to the level of its least component, that is assigned an SMR code for the level of maintenance under consideration (i.e., identified as maintenance significant).
22. Clean. Step-by-step instructions on how to remove dirt, corrosion or other contaminants from equipment. Refer to appropriate painting, lubrication, and preservation methods to restore original corrosion prevention and control methods when removed as a result of cleaning and/or when using cleaning to remove corrosion from the item.
23. Non destructive inspection. Step-by-step instructions on preparation and accomplishment inspections which do not destroy or damage the equipment.
24. Radio interference suppression. Step-by-step instructions to ensure installed equipment, either communication or other electronics, does not interfere with installed communication equipment.
25. Place in service. Step-by-step instructions required to place an item into service that are not covered in the service upon receipt work package.
26. Towing. The step-by-step instructions to connect one vehicle to another for the purpose of having one vehicle moved through the motive power of the other vehicle.
27. Jacking. The step-by-step instructions to mechanically raise or lift a vehicle to facilitate maintenance on the vehicle.
28. Parking. Step-by-step instructions to safely place a vehicle in a lot, ramp area or other designated location.
29. Mooring. Step-by-step instructions to secure a vehicle by chains, ropes or other means to protect the vehicle from environmental conditions or secure for transportation.
30. Covering. Step-by-step instructions to place a protective wrapping over a vehicle to protect it from environmental conditions or to hide (e.g., camouflage) it.
31. Hoisting. Step-by-step instructions to allow a vehicle to be raised by cables or ropes through attaching points.
32. Sling loading. Step-by-step instructions to place a sling around a vehicle to allow it to be raised.
33. External power. Step-by-step instructions on how to apply electrical power from any authorized power source (e.g., external generator or facility power).
34. Preparation for storage or shipment. Step-by-step instructions for preparing the equipment for placement into administrative storage or for special transportation requirements.

INTRODUCTION - Continued

35. Arm. Detailed instructions on activating munitions prior to use.
36. Load. This may be one of two tasks:
    a. For transportation, the act of placing assets onto a transportation medium (e.g., pallet, truck, container).
    b. For weapons/weapons systems, the act of placing munitions into the weapon/weapons system.
37. Unload. This may be one of two tasks:
    a. For transportation, the act of removing assets from a transportation medium (e.g., pallet, truck, container).
    b. For weapons/weapons systems, the act of removing munitions from the weapon/weapons system.
38. Software maintenance. Step-by-step instructions for software maintenance (e.g., installing, un-installing, etc.).

Explanation of Columns in the MAC

Column (1) Group Number. Column (1) lists Functional Group Code (FGC) numbers, the purpose of which is to identify maintenance significant components, assemblies, subassemblies, and modules with the Next Higher Assembly (NHA).

Column (2) Component/Assembly. Column (2) contains the item names of components, assemblies, subassemblies, and modules for which maintenance is authorized.

Column (3) Maintenance Function. Column (3) lists the functions to be performed on the item listed in column (2). (For a detailed explanation of these functions, refer to maintenance functions (tasks) outlined previously.)

Column (4) Maintenance Level. Column (4) specifies each level/class of maintenance authorized to perform each function listed in column (3), by indicating work time required in the appropriate sub-column. This work time figure represents the active time required to perform that maintenance task at the indicated level/class of maintenance. If the number or complexity of the tasks within the listed maintenance task varies at different maintenance classes, appropriate work time figures are to be shown for each class.

The work time figure represents the average time required to perform the prescribed task (assembly, subassembly, component, module, end item, or system) on the item under typical operating conditions for that maintenance level/class. This time includes preparation time (including any necessary disassembly/assembly time), troubleshooting/fault location time, and quality assurance time in addition to the time required to perform the specific tasks identified for the maintenance tasks authorized in the MAC. The symbol designations for the various maintenance levels/classes and classes are as follows:

Field:

C Crew maintenance

F Maintainer maintenance

Sustainment:

L Specialized Repair Activity (SRA)

H Below depot Maintenance

D Depot Maintenance

INTRODUCTION - Continued

NOTE

The “L” maintenance level is not included in column (4) of the MAC. Functions to this class of maintenance are identified by a work time figure in the “H” column of column (4), and an associated reference code is used in the REMARKS column (6). This code is keyed to the remarks and the SRA complete repair application is explained there.

Column (5) Tools and Equipment Reference Code. Column (5) specifies, by code, those common tools sets (not individual tools), common TMDE, and special tools, special TMDE, and special support equipment required to perform the designated functions. Codes are keyed to the tools and test equipment table.

Column (6) Remarks Code. When applicable, this column contains a letter code, in alphabetical order, which is keyed to the remarks table entries.

Explanation of Columns in the Tools and Test Equipment Requirements

Column (1) Tool or Test Equipment Reference Code. The tool or test equipment reference code correlates with a code used in column (5) of the MAC.

Column (2) Maintenance Level. The lowest class of maintenance authorized to use the tool or test equipment.

Column (3) Nomenclature. Name or identification of the tool or test equipment.

Column (4) National Stock Number (NSN). The NSN of the tool or test equipment.

Column (5) Tool Number. The manufacturer's part number.

Explanation of Columns in the Remarks

Column (1) Remarks Code. The code recorded in column (6) of the MAC.

Column (2) Remarks. This column lists information pertinent to the maintenance task being performed as indicated in the MAC.

END OF WORK PACKAGE

MAINTAINER
MAINTENANCE ALLOCATION CHART

Table 1. MAC FOR MFS TRM.

(1) GROUP NUMBER	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL				(5) TOOLS AND EQUIPMENT REFERENCE CODE	(6) REMARKS CODE
			FIELD		SUSTAINMENT			
			CREW	MAINTAINER	BELOW DEPOT	DEPOT		
			(C)	(F)	(H)	(D)		
00	MFS TRM	Inspect	0.1	0.5				A, C
0001	Ladder Point Adapter	Replace		0.5			4	G
01	TANK ASSEMBLY	Inspect	0.1					A
		Inspect		0.5				C
0101	Bottom Loading Valve (V1)	Inspect	0.2					A
		Replace		2.5			2, 4, 6	B
		Clean		0.5				
0102	Tank Discharge Valve (V2)	Inspect	0.2					A
		Replace		1.3			2, 4, 6	B
		Clean		0.2				
0103	Fusible Link	Inspect	0.2					A
		Replace		0.5			4	B
0104	Jet Level Sensor	Test	0.1					A
		Replace		1.5			4	B
0105	Manhole Cover Assembly	Inspect	0.1					A
		Replace		0.5			4	B
		Service		0.1				A
010501	Manhole Cover Fill Plate Gasket	Inspect	0.1					A
		Replace		0.5			4	B

Table 1. MAC FOR MFS TRM - Continued.

(1) GROUP NUMBER	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL				(5) TOOLS AND EQUIPMENT REFERENCE CODE	(6) REMARKS CODE
			FIELD		SUSTAINMENT			
			CREW	MAINTAINER	BELOW DEPOT	DEPOT		
			(C)	(F)	(H)	(D)		
010502	Fire Screen	Replace		0.5			4	F
		Clean		0.2			4	F
0106	Spillbox Lid and Gasket Assembly	Inspect	0.2					A
		Replace		0.5			4	B
		Service		0.1				A
010601	Spillbox Lid Gas Spring	Inspect	0.2					A
		Replace		0.2			4	B
0107	Spillbox Drain Lines	Inspect		1.0				
		Replace		0.8			2, 4	B
		Clean		0.2				
0108	Vent Valve Assembly	Replace		0.8				B
		Clean		0.2			4	
0109	Port F (V17) Dry Break Coupling	Inspect	0.2					A
		Replace	0.2	1.0			2, 4	B, D
		Repair		1.0			2, 4	B
0110	Tank Gauge	Inspect	0.1					A
		Service		0.1				A
		Replace		0.4			4	B
0111	Gauge Tube Assembly	Inspect		0.1				A
		Replace		1.0			4	B
02	FRAME ASSEMBLY	Inspect	0.1					A
		Inspect		0.2			7	C

Table 1. MAC FOR MFS TRM - Continued.

(1) GROUP NUMBER	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL				(5) TOOLS AND EQUIPMENT REFERENCE CODE	(6) REMARKS CODE
			FIELD		SUSTAINMENT			
			CREW	MAINTAINER	BELOW DEPOT	DEPOT		
			(C)	(F)	(H)	(D)		
0201	Front Catwalk Assembly	Inspect	0.3					A
		Replace		3.0			4	B
0202	Rear Catwalk Assembly	Inspect	0.3					A
		Replace		1.0			4	B
0203	Front Handhold Assembly	Inspect	0.1					A
		Service		0.1			4	
		Replace		0.2			4	B
0204	Rear Handhold Assembly	Inspect	0.1					A
		Service		0.1				
		Replace		0.5			4	B
0205	Handrail Assembly	Inspect	0.1					A
		Service		0.1				
		Replace		1.0			4	B
		Repair		1.0			4	B
0206	Roller Wheel Assemblies	Inspect	0.1					A
		Repair		0.1			4	B
0207	Hose Mount Grate	Inspect	0.1					A
		Replace		1.0			4	B
0208	Filter Deck Mount Grate and H-Bracket	Inspect		0.1				A
		Replace		4.0			4	B
0209	Pump Mount Grate	Inspect	0.1					A
		Replace		9.0			4	B

Table 1. MAC FOR MFS TRM - Continued.

(1) GROUP NUMBER	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL				(5) TOOLS AND EQUIPMENT REFERENCE CODE	(6) REMARKS CODE
			FIELD		SUSTAINMENT			
			CREW	MAINTAINER	BELOW DEPOT	DEPOT		
			(C)	(F)	(H)	(D)		
03	CONTROL CABLE ASSEMBLY	Inspect	0.1					A
0301	Control Cable Adjustments	Inspect	0.1					A
		Adjust		0.3			4	
		Test		0.2				
0302	Control Lever Assembly (V1/V2)	Inspect	0.1					A
		Service		0.1				A
		Replace		2.0			4	B
0303	Control Cables	Inspect	0.1					A
		Service		0.1				A
		Replace		1.0			4	B
0304	Emergency Levers	Inspect	0.1					A
		Replace		1.0			4	B
0305	Control Cable Tubing Assembly	Inspect	0.1					A
		Replace		5.0			4	B
04	PIPING ASSEMBLY	Inspect	0.2					A
0401	Precheck Valve (V16) and Flex Line	Inspect	0.1					A
		Replace		1.9			2, 4	B
		Clean		0.1				
0402	Electric Motor Assembly	Inspect	0.2					A
		Replace		1.5			4	B

Table 1. MAC FOR MFS TRM - Continued.

(1) GROUP NUMBER	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL				(5) TOOLS AND EQUIPMENT REFERENCE CODE	(6) REMARKS CODE
			FIELD		SUSTAINMENT			
			CREW	MAINTAINER	BELOW DEPOT	DEPOT		
			(C)	(F)	(H)	(D)		
0403	Pump Assembly	Inspect	0.1					A
		Service		0.1				
		Replace		2.4			2, 4, 5	B
		Clean		0.1				B
0404	Valve Adapter Assembly	Inspect	0.1					A
		Replace		0.3				
		Repair	0.1	0.6			2, 4, 6	B, D
		Clean		0.1				
0405	Tee Assembly	Inspect	0.1					A
		Replace		0.3				
		Repair	0.1	1.9			2, 4, 6	B, D
		Clean		0.1				
0406	Flexible Hoses	Inspect	0.1					A
		Replace		1.0			2, 4	B
0407	Left Side Piping Assembly	Inspect	0.7					A
		Repair		1.9			4	B
		Clean		0.1				
040701	Tank Return Ball Valve (V9)	Inspect	0.7					A
		Replace		1.9			2, 4, 5	B
		Clean		0.1				
0407010 1	Tank Return Check Valve (V20)	Replace		0.5			2, 4	F
040702	Pump Discharge Ball Valve (V10/V11)	Inspect	0.1					A
		Replace		1.4			2, 4, 5	B
		Clean		0.1				

Table 1. MAC FOR MFS TRM - Continued.

(1) GROUP NUMBER	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL				(5) TOOLS AND EQUIPMENT REFERENCE CODE	(6) REMARKS CODE
			FIELD		SUSTAINMENT			
			CREW	MAINTAINER	BELOW DEPOT	DEPOT		
			(C)	(F)	(H)	(D)		
040703	Metered Gravity Discharge Ball Valve (V12)	Inspect	0.1					A
		Replace		1.4			2, 4, 5	B
		Clean		0.1				
040704	Evacuation Return Ball Valve (V15)	Inspect	0.1					A
		Replace		0.4			2, 4, 5	B
		Clean		0.1				
0408	Ball Valve Placard	Inspect	0.1					A
		Replace		0.1			4	B
0409	Discharge Port B Control Valve (V4)	Inspect	1.0					A
		Repair		1.4			4, 6	B
		Clean		0.1				
0410	Discharge Port G Control Valve (V3)	Inspect	0.2					A
		Repair		0.9			4, 6	B
		Clean		0.1				
0411	Discharge Port A Control Valve (V5)	Inspect	0.1					A
		Repair		1.4			4, 6	B
		Clean		0.1				
0412	Discharge Port C Control Valve (V6)	Inspect	0.1					A
		Repair		1.4			4, 6	B
		Clean		0.1				

Table 1. MAC FOR MFS TRM - Continued.

(1) GROUP NUMBER	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL				(5) TOOLS AND EQUIPMENT REFERENCE CODE	(6) REMARKS CODE
			FIELD		SUSTAINMENT			
			CREW	MAINTAINER	BELOW DEPOT	DEPOT		
			(C)	(F)	(H)	(D)		
0413	Valved Drybreak Port D/E Control Valves (V7/V8)	Inspect	0.1					A
		Replace	0.2	0.4			2, 4, 5	B, D
		Clean		0.1				
		Repair		1.0			2, 4	B
0414	Right Side Piping Assembly	Inspect	0.1					A
		Replace		1.0				
		Repair		3.9			4	B
		Clean		0.1				
0415	Bottom Piping Assembly, Elbow	Inspect	0.1					A
		Replace		1.4			4	B
		Clean		0.1				
0416	Bottom Piping Assembly, Front Piping	Inspect	0.1					A
		Replace		1.4			4	B
		Clean		0.1				
0417	Bottom Piping Assembly, Tee	Inspect	0.1					A
		Replace		1.4			2, 4	B
		Clean		0.1				
0418	Bottom Piping Assembly, Rear Piping	Inspect	0.1					A
		Replace		2.9			2, 4, 5	B
		Clean		0.1				

Table 1. MAC FOR MFS TRM - Continued.

(1) GROUP NUMBER	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL				(5) TOOLS AND EQUIPMENT REFERENCE CODE	(6) REMARKS CODE
			FIELD		SUSTAINMENT			
			CREW	MAINTAINER	BELOW DEPOT	DEPOT		
			(C)	(F)	(H)	(D)		
0419	Strainer Assembly	Inspect	0.1					A
		Replace		1.0				
		Repair		1.5			2, 4, 5	B
		Clean		0.1				
0419	Strainer Assembly (ADR)	Replace		4.0			2, 4, 5	F
041901	V21 Strainer Inlet Ball Valve	Replace		1.0			2, 4	F
041902	V22 Strainer Outlet Ball Valve	Replace		1.0			2, 4	F
0420	Strainer Assembly Basket	Inspect	0.1					A
		Replace		0.4			4	B
		Clean		0.1				
0421	Flow Meter Assembly	Inspect	0.1					A
		Replace		0.9			2, 4, 5	B
		Clean		0.1				
042101	Flow Meter Components	Inspect	0.1					A
		Replace		0.1				
		Repair		0.1			4	B
042102	Flow Meter Piping	Inspect	0.1					A
		Repair		3.9			2, 4, 5	B
		Clean		0.1				

Table 1. MAC FOR MFS TRM - Continued.

(1) GROUP NUMBER	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL				(5) TOOLS AND EQUIPMENT REFERENCE CODE	(6) REMARKS CODE
			FIELD		SUSTAINMENT			
			CREW	MAINTAINER	BELOW DEPOT	DEPOT		
			(C)	(F)	(H)	(D)		
042103	Meter Inlet Ball Valve (V13)	Inspect	0.1					A
		Replace		1.4			2, 4, 5	B
		Clean		0.1				
042104	Meter Outlet Ball Valve (V14)	Inspect	0.1					A
		Replace		1.4			2, 4, 5	B
		Clean		0.1				
0422	Vacuum Breaker (VB1)	Inspect	0.1					A
		Replace		0.2			2, 4	B
		Clean		0.1				
042201	Check Valve V23	Replace		1.5			4	F
05	POWER CONTROL BOX ASSEMBLY	Inspect	0.2					A
0501	Power Control Box	Inspect	0.1					A
		Replace		0.5			4	B, E
050101	Power Control Box 70 Amp Circuit Breaker	Inspect	0.1					A
		Replace		0.5			4	B
050102	Power Control Box Diode Assembly	Inspect	0.1					A
		Replace		0.5			4	B
050103	Power Control Box EMI Channel Filter	Inspect	0.1					A
		Replace		0.3			4	B

Table 1. MAC FOR MFS TRM - Continued.

(1) GROUP NUMBER	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL				(5) TOOLS AND EQUIPMENT REFERENCE CODE	(6) REMARKS CODE
			FIELD		SUSTAINMENT			
			CREW	MAINTAINER	BELOW DEPOT	DEPOT		
			(C)	(F)	(H)	(D)		
050104	Power Control Box Master Switch	Inspect	0.1					A
		Replace		0.3			2, 4	B
050105	Power Control Box NATO Slave Receptacle	Inspect	0.1					A
		Replace		0.4			4	B
050106	Power Control Box Pump Control Toggle Switch	Inspect	0.1					A
		Replace		0.2			4	B
050107	Power Control Box Relay	Inspect	0.1					A
		Replace		1.0			4	B
050108	Power Control Box Remote Connector	Inspect	0.1					A
		Replace		0.2			4	B
050109	Test Light LED Assembly	Inspect	0.1					A
		Replace		0.3			4	B
0502	Power Control Box Wiring	Inspect	0.1					A
		Replace		1.7			4	B
06	BII/COEI CABINET ASSEMBLY	Inspect	0.2					A
		Service		0.1				
		Replace		1.5			4	B
		Repair		0.5			4	B

Table 1. MAC FOR MFS TRM - Continued.

(1) GROUP NUMBER	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL				(5) TOOLS AND EQUIPMENT REFERENCE CODE	(6) REMARKS CODE
			FIELD		SUSTAINMENT			
			CREW	MAINTAINER	BELOW DEPOT	DEPOT		
			(C)	(F)	(H)	(D)		
07	MFS TRM TO HEMTT HOSE	Inspect	0.2					A
		Repair	0.2					D
		Repair		0.5			4	B, C
08	2-INCH HOSE ASSEMBLY	Inspect	0.2					A
		Repair	0.2					D
		Repair		0.2			4	B, C
		Clean		0.1				
09	4-INCH HOSE ASSEMBLY	Inspect	0.1					A
		Repair	0.2					D
		Repair		0.3			4	B, C
		Clean		0.1				
10	FUEL NOZZLE	Inspect	0.1					A
		Repair	0.2					D
		Repair		0.5			2, 4, 5	B, C
11	GROUND STRAPS	Inspect	0.1					A
		Service	0.2					
		Test		0.5			1	
		Replace		0.5			1, 2, 3, 4, 6, 7	B
12	VAPOR RECOVERY LINE ASSEMBLY	Inspect	0.2					A
		Replace		0.9			4	B
		Clean		0.1				
13	STOWABLE LADDER	Inspect	0.1					A
		Repair		0.5			4	B

Table 1. MAC FOR MFS TRM - Continued.

(1) GROUP NUMBER	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL				(5) TOOLS AND EQUIPMENT REFERENCE CODE	(6) REMARKS CODE
			FIELD		SUSTAINMENT			
			CREW	MAINTAINER	BELOW DEPOT	DEPOT		
			(C)	(F)	(H)	(D)		
14	STEP ASSEMBLY, VEHICULAR (LADDER PLATFORM)	Inspect	0.1					A
		Repair		0.5			4	B
15	FIXED LADDER	Inspect	0.1					A
		Replace		0.5			4	B
16	HOSE TUBE CABINET ASSEMBLY	Inspect	0.3					A
		Service	0.1					
		Replace		1.0			4	A
		Repair		1.5			2, 4	B
17	FILTER/ SEPARATOR ASSEMBLY	Inspect	0.2					A
		Replace		6.0			4	B
1701	Filter/Separator Assembly Elements and Lid Gasket	Inspect	0.1					A
		Replace		1.3			2, 4	B
		Inspect		0.1				
		Clean		0.1				
1702	Filter/Separator Fuel Drain Valve Assembly	Inspect	1.2					A
		Repair		0.4			4	B
		Clean		0.1				
1703	Filter/Separator Water Drain Valve Assembly	Inspect	1.2					A
		Repair		0.4			2, 4, 5	B
		Clean		0.1				

Table 1. MAC FOR MFS TRM - Continued.

(1) GROUP NUMBER	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL				(5) TOOLS AND EQUIPMENT REFERENCE CODE	(6) REMARKS CODE
			FIELD		SUSTAINMENT			
			CREW	MAINTAINER	BELOW DEPOT	DEPOT		
			(C)	(F)	(H)	(D)		
1704	Filter/Separator Sampling Ports	Inspect	1.2					A
		Replace		1.9			4	B
		Clean		0.1				
1705	Filter/Separator Differential Pressure Gauge	Inspect	1.2					A
		Replace		0.9			2, 4	B
		Clean		0.1				
1706	Filter/Separator Sight Gauge	Inspect	1.2					A
		Replace		0.5			4	B
1707	Filter/Separator Piping	Inspect	1.2					A
		Repair		6			2, 4, 5	B
1709	ADR Check Valve V18, V19	Inspect	0.1					A
		Replace		1.6			4	F
		Clean		0.2				
18	ISO RACK PLACARDS	Inspect	0.2					A
		Replace		0.1			4	B
19	DATA PLATES	Inspect	0.2					A
		Replace		0.2			4	B
		Clean	0.2					
20	STATIC REEL	Test	0.1					A
		Inspect		0.1				
		Service		0.1				
		Replace		0.5			1, 3, 4	B
2001	ADR Bonding Clamp	Replace		0.5			4	F
		Test		0.1			1	F

Table 1. MAC FOR MFS TRM - Continued.

(1) GROUP NUMBER	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL				(5) TOOLS AND EQUIPMENT REFERENCE CODE	(6) REMARKS CODE
			FIELD		SUSTAINMENT			
			CREW	MAINTAINER	BELOW DEPOT	DEPOT		
			(C)	(F)	(H)	(D)		
21	FIRE EXTINGUISHER BRACKETS	Inspect	0.1					A
		Replace		0.2			4	B

Table 2. Tools and Test Equipment for MFS TRM.

TOOL OR TEST EQUIPMENT REF CODE	MAINTENANCE LEVEL	NOMENCLATURE	NATIONAL STOCK NUMBER	TOOL NUMBER
1	F	Multimeter, digital		GMTK
2	F	Standard automotive tool set (SATS)	4910-01-490-6453	SC 4910-95-A81
3	F	Static Cable	6150-01-664-2460	1051G-26
4	F	Tool kit, general mechanic's	5180-01-548-7634	SC 5180-95-B47
5	F	Wrench, internal pipe	5120-00-288-8779	31405
6	F	Wrench, torque, click, ratcheting, 3/8 inch drive, 20 to 100 lb-ft.	5120-01-648-5686	
7	F	Wrench, torque, click, ratcheting, 1/2 inch drive, 250 lb-ft	5120-01-648-5692	

Table 3. Remarks for the MFS TRM.

REMARKS CODE	REMARKS
A	Crew/operator inspection limited to Preventive Maintenance Checks and Services (PMCS).
B	Repair to consist of replacement of parts only at Field Level Maintenance.
C	Limited repair at field and complete repair at the below depot sustainment level.
D	Limited repair at operator level.
E	Repair consists of replacement of components.
F	Applies to TRM with ADR.
G	For SN 0001 - 0949.

END OF WORK PACKAGE

MAINTAINER
EXPENDABLE AND DURABLE ITEMS LIST

INTRODUCTION

Scope

This work package lists expendable and durable items that you will need to operate and maintain the Modular Fuel System Tank Rack Module (MFS TRM). This list is for information only and is not authority to requisition the listed items. These items are authorized to you by CTA 50-970, Expendable/Durable Items (Except Medical, Class V Repair Parts, and Heraldic Items), CTA 50-909, Field and Garrison Furnishings and Equipment or CTA 8-100, Army Medical Department Expendable/Durable Items.

Explanation of Columns in the Expendable/Durable Items List

Column (1) Item No. This number is assigned to the entry in the list and is referenced in the narrative instructions to identify the item (e.g., Use brake fluid (WP 0098, item 5)).

Column (2) Level. This column identifies the lowest level of maintenance that requires the listed item (C = Crew, F = Maintainer, H = BelowDepot, D = Depot).

Column (3) National Stock Number (NSN). This is the NSN assigned to the item which you can use to requisition it.

Column (4) Item Name, Description, Part Number/(CAGEC). This column provides the other information you need to identify the item. The last line below the description is the part number and the Commercial and Government Entity Code (CAGEC) (in parentheses).

Column (5) U/I. Unit of Issue (U/I) code shows the physical measurement or count of an item, such as gallon, dozen, gross, etc.

Table 1. Expendable/Durable Items List.

(1) ITEM NO.	(2) LEVEL	(3) NATIONAL STOCK NUMBER (NSN)	(4) ITEM NAME, DESCRIPTION, PART NUMBER/ (CAGEC)	(5) U/I
1	F	4235-01-436-8317	Absorbent material PLP201 (1JA49)	BG
2	F	8040-01-665-1574	Adhesive, multi-purpose 71155 (1ZC62)	TB
3	F	6850-01-474-2302	Cleaning compound, solvent, MIL-PRF-680 (81349)	GL
4	F	7920-00-044-9281	Cloth, cleaning, A-A-59323 (58536)	BX
5	F	8415-01-492-0178	Gloves, disposable nitrile, 8415014920178 (80244)	BX
6	F	4240-01-542-8193	Goggles, industrial, GOG (4VB38)	PR
7	F	9150-01-197-7689	Grease, automotive and artillery, M-10924-D (81349)	CN
8	F	5975-01-657-0529	Large cable tie L-36-175-0-L (65664)	PG
9	F	9150-00-263-3490	Oil, lubricating general purpose 10W 1 qt. can MIL-PRF-7870 (81349)	QT
10	F	9150-00-250-0926	Petrolatum, technical 14P1 (82146)	CN
11	F	4240-01-269–4169	Respirator, air filtering 313000 (39SU9)	EA
12	F	8040-01-193-3312	Sealant, Silicone, RTV, one component 17100 (0RZG3)	TB
13	F	8030-01-516-0406	Sealing compound LOCTITE 242 (05972)	BT
14	F	5975-01-664-9287	Small cable tie L-14-50-0-C (65664)	HD
15	F	8030-01-479-0487	Thread sealing compound 56541 (05972)	CN
16	F	5340-01-663-7196	Tie down strap, rubber, drip pan 635197740 (0GPL7)	EA
17	F	5975-01-132-6170	Wire marker books PMCB-2 (06383)	EA

END OF WORK PACKAGE

MAINTAINER
TOOL IDENTIFICATION LIST

INTRODUCTION

Scope

This work package lists common tools and supplements and special tools/fixtures needed to maintain the Modular Fuel System Tank Rack Module (MFS TRM).

Explanation of Columns in the Tool Identification List

Column (1) Item No. This number is assigned to the entry in the list and is referenced in the initial setup to identify the item (e.g., Extractor (WP 0090, item 32)).

Column (2) Item Name. This column lists the item by noun nomenclature and other descriptive features (e.g., Gauge, belt tension).

Column (3) National Stock Number (NSN). This is the National Stock Number (NSN) assigned to the item; use it to requisition the item.

Column (4) Part Number/(CAGEC). Indicates the primary number used by the manufacturer (individual, company, firm, corporation, or Government activity) which controls the design and characteristics of the item by means of its engineering drawings, specifications, standards, and inspection requirements to identify an item or range of items. The manufacturer's Commercial and Government Entity Code (CAGEC) is also included.

Column (5) Reference. This column identifies the authorizing supply catalog, components list, or RPSTL for items listed in this work package.

Table 1. Tool Identification List.

(1) ITEM NO.	(2) ITEM NAME	(3) NATIONAL STOCK NUMBER (NSN)	(4) PART NUMBER/ (CAGEC)	(5) REFERENCE
1	25’ Grounding Cable (Static Cable)	6150-01-664-2460	1051G-26 (55242)	
2	Crow's foot attachment, 3/4 inch	5120-01-652-0419	J4924HFL (1CV05)	SATS KTC S0161
3	Drill	5130-01-652-1094	DCD940KX (07429)	SATS
4	Drill bits	5133-01-648-4544	95600OLEPRO (80244)	SATS
5	Grease gun (Lubricating gun, hand)		(00NS2)	SATS KTC S0248
6	Multimeter, digital		61-609 (00NS2)	SATS
7	Oiler, hand	4930-00-262-8870	A-50477-B0-B-A (58536)	SATS
8	Pan, drip	4940-01-657-8605	1051A-14 (55242)	
9	Pliers, multiple position	5120-01-648-4570	440 (71612)	SATS
10	Rivet, gun	5180-01-652-1045	D-9000-MIL-2 (64878)	SATS
11	Screwdriver, set, jeweler’s	5120-01-645-0077	97-0206 (89750)	SATS KTC S0316
12	Socket, 1 5/8 inch	5120-01-648-4559	J5752 (1CV05)	SATS
13	Tool kit, general mechanic’s	5180-01-548-7634	SC 5180-95-B47	
14	Vise, machinist’s	5120-01-652-0440	204 (66983)	SATS
15	Wire brush	7920-01-648-7537	33720 (0GR19)	SATS
16	Wrench, adjustable, 15 inch	5120-01-652-1070	C715 (65LN0)	SATS

Table 1. Tool Identification List - Continued.

(1) ITEM NO.	(2) ITEM NAME	(3) NATIONAL STOCK NUMBER (NSN)	(4) PART NUMBER/ (CAGEC)	(5) REFERENCE
17	Wrench, adjustable, automotive	5120-01-648-4565	C718 (65LN0)	SATS
18	Wrench, internal pipe	5120-00-288-8779	31405 (50893)	
19	Wrench, pipe, 18 inch	5120-01-652-0484	31025 (50893)	SATS
20	Wrench, socket impact, 1/2” drive, 6 pt, deep, 15/16”	5130-01-648-7896	J7330H (1CV05)	SATS
21	Wrench, socket, 3/4 inch drive	5120-01-652-0492	J5649 (1CV05)	SATS KTC S0374
22	Wrench, torque, click, ratcheting, 1/2 inch drive, 250 lb-ft	5120-01-648-5692	M3R250F (48588)	SATS
23	Wrench, torque, click, ratcheting, 3/8 inch drive, 20 to 100 lb-ft	5120-01-648-5686		SATS

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RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS For use of this form, see AR 25-30; the proponent agency is CIO.	Use **Part II** (reverse for Repair Parts and Special Tool Lists (RPSTL)).	DATE Date form filled

INSTRUCTIONS FOR SUBMITTING THE DA FORM 2028

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0007-3: Figure 2, Item 9 should show a lock washer. Currently shows a flat washer.

0018-2: Cleaning and inspection, Step 6, reference to governor support pin (14) is wrong reference. Reference should be changed to (12).

SAMPLE

TYPED NAME, GRADE/RANK, POSITION TITLE, E-MAIL ADDRESS	TELEPHONE NUMBER/DSN/ EXTENSION	SIGNATURE
Your name	Your phone number	Your signature

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SAMPLE

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25 September 2017

By Order of the Secretary of the Army:

MARK A. MILLEY
General, United States Army
Chief of Staff

Official:

GERALD B. O'KEEFE
Administrative Assistant to the
Secretary of the Army
1722356

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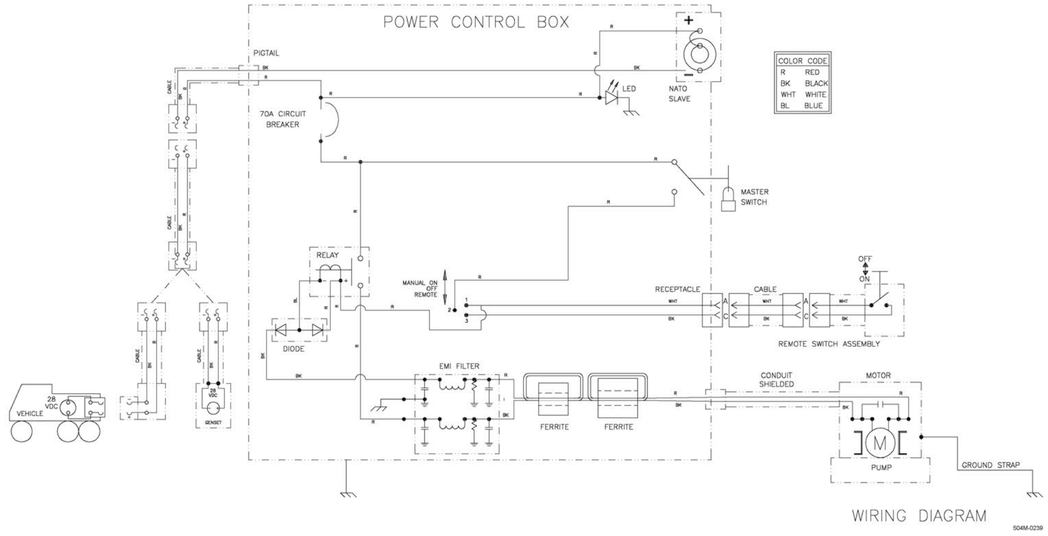

FO-1. Schematic

THE METRIC SYSTEM AND EQUIVALENTS

Linear Measure

1 Centimeter = 10 Millimeters = 0.01 Meters = 0.3937 Inches
1 Meter = 100 Centimeters = 1000 Millimeters = 39.37 Inches
1 Kilometer = 1000 Meters = 0.621 Miles

Weights

1 Gram = 0.001 Kilograms = 1000 Milligrams = 0.035 Ounces
1 Kilogram = 1000 Grams = 2.2 Pounds
1 Metric Ton = 1000 Kilograms = 1 Megagram = 1.1 Short Tons

Liquid Measure

1 Milliliter = 0.001 Liters = 0.0338 Fluid Ounces
1 Liter = 1000 Milliliters = 33.82 Fluid Ounces

Square Measure

1 Sq Centimeter = 100 Sq Millimeters = 0.155 Sq Inches
1 Sq Meter = 10,000 Sq Centimeters = 10.76 Sq Feet
1 Sq Kilometer = 1,000,000 Sq Meters = 0.0386 Sq Miles

Cubic Measure

1 Cu Centimeter = 1,000 Cu Millimeters = 0.06 Cu Inches
1 Cu Meter = 1,000,000 Cu Centimeters = 35.31 Cu Feet

Temperature

9/5 °C +32 = °F
5/9 (°F - 32) = °C
212° Fahrenheit is equivalent to 100° Celsius
90° Fahrenheit is equivalent to 32.2° Celsius
32° Fahrenheit is equivalent to 0° Celsius

APPROXIMATE CONVERSION FACTORS

To Change	To	Multiply By
Inches	Centimeters	2.540
Feet	Meters	0.305
Yards	Meters	0.914
Miles	Kilometers	1.609
Sq Inches	Sq Centimeters	6.451
Sq Feet	Sq Meters	0.093
Sq Yards	Sq Meters	0.836
Sq Miles	Sq Kilometers	2.590
Acres	Sq Hectometers	0.405
Cubic Feet	Cubic Meters	0.028
Cubic Yards	Cubic Meters	0.765
Fluid Ounces	Milliliters	29.573
Pints	Liters	0.473
Quarts	Liters	0.946
Gallons	Liters	3.785
Ounces	Grams	28.349
Pounds	Kilograms	0.454
Short Tons	Metric Tons	0.907
Pound-Feet	Newton-Meters	1.356
Pounds per Sq Inch	Kilopascals	6.895
Miles per Gallon	Kilometers per Liter	0.425
Miles per Hour	Kilometers per Hour	1.609

To Change	To	Multiply By
Centimeters	Inches	0.394
Meters	Feet	3.280
Meters	Yards	1.094
Kilometers	Miles	0.621
Sq Centimeters	Sq Inches	0.155
Sq Meters	Sq Feet	10.764
Sq Meters	Sq Yards	1.196
Sq Kilometers	Sq Miles	0.386
Sq Hectometers	Acres	2.471
Cubic Meters	Cubic Feet	35.315
Cubic Meters	Cubic Yards	1.308
Milliliters	Fluid Ounces	0.034
Liters	Pints	2.113
Liters	Quarts	1.057
Liters	Gallons	0.264
Grams	Ounces	0.035
Kilograms	Pounds	2.205
Metric Tons	Short Tons	1.102
Newton-Meters	Pound-Feet	0.738
Kilopascals	Pounds per Sq Inch	0.145
Kilometers per Liter	Miles per Gallon	2.354
Kilometers per Hour	Miles per Hour	0.621

PIN 106836-000